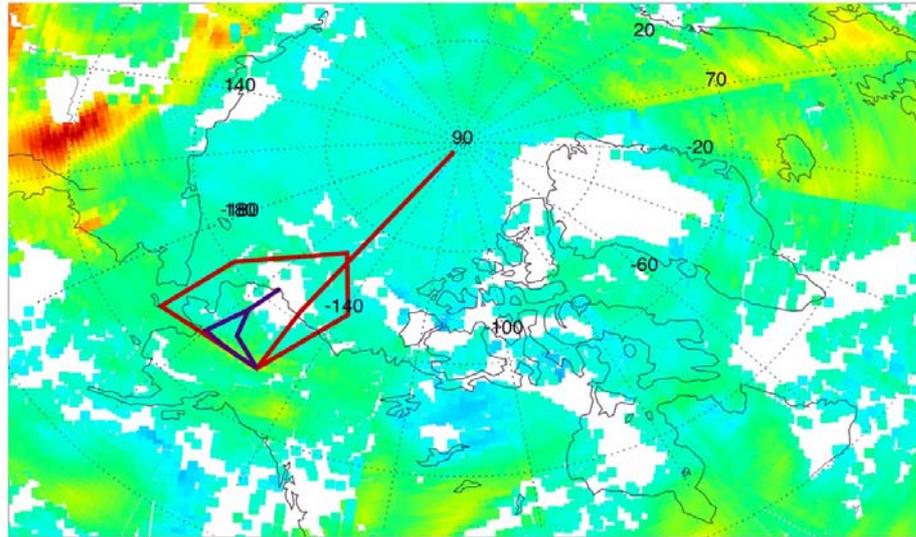
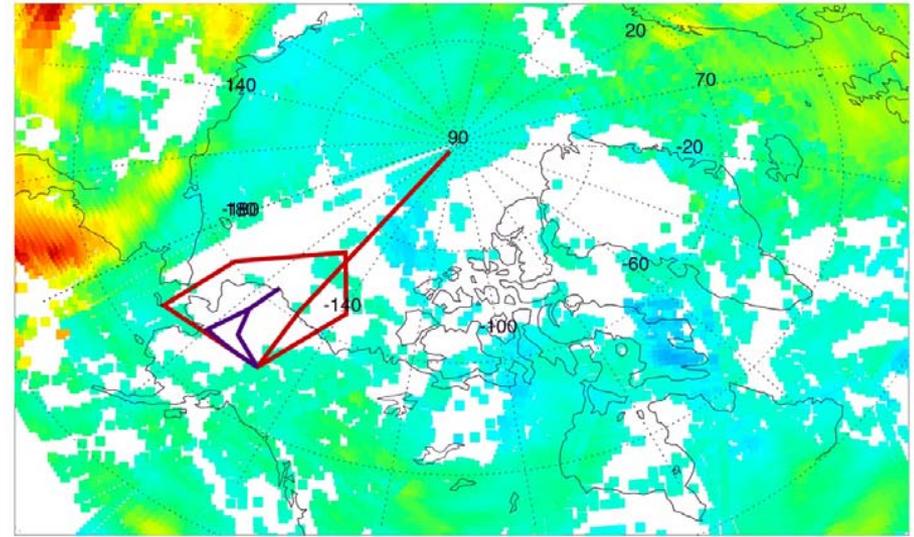


AIRS NRT ARCTAS Support: Latest AIRS CO

AIRS CO VMR (ppbv) at 500mb on 20080414 for ARCTAS



AIRS CO VMR (ppbv) at 500mb on 20080415 for ARCTAS

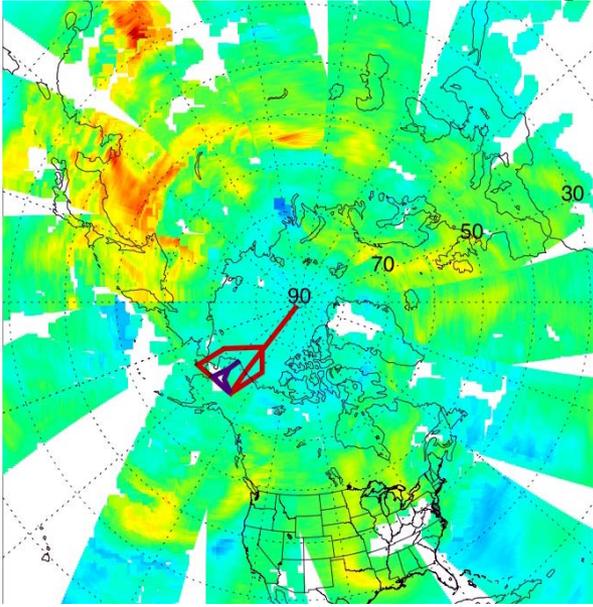


CONTACT: Dr. Juying Warner <juying@umbc.edu>; ACKNOWLEDGEMENT: AIRS NRT products by NASA DA, CONTACT: Dr. Juying Warner <juying@umbc.edu>; ACKNOWLEDGEMENT: AIRS NRT products by NASA DA.

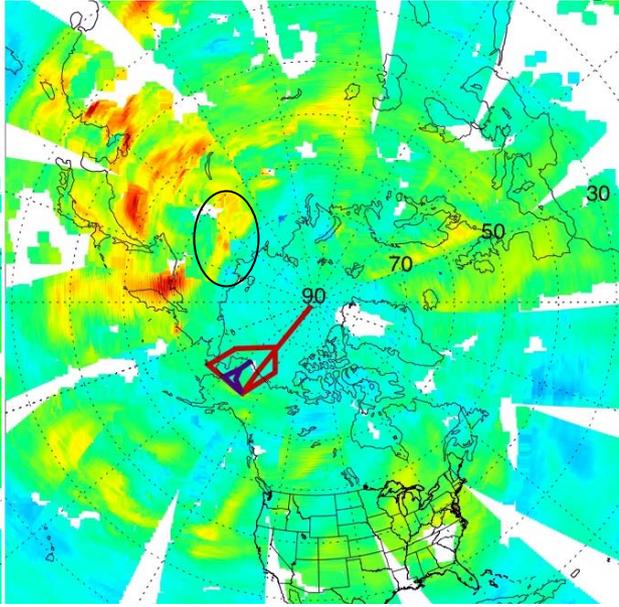
- Asian transport continues and a fast moving system.
- Transport from the European side into the Arctic circle continues.

AIRS NRT ARCTAS Support:

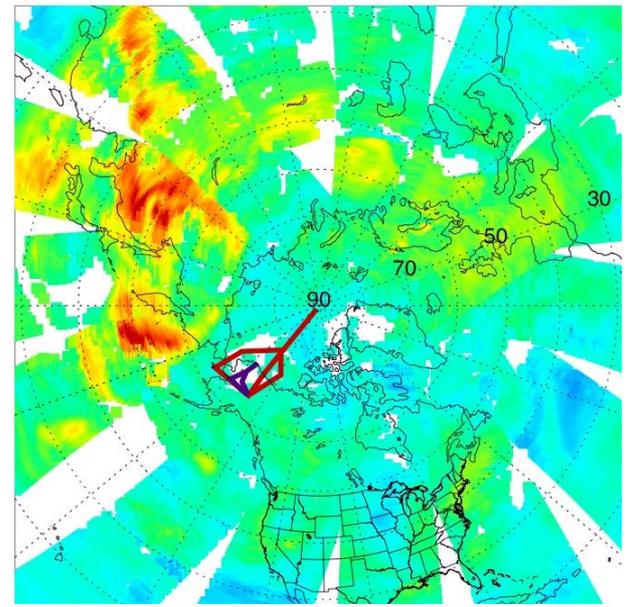
CO 500mb 20080413 day



CO 500mb 20080414 day



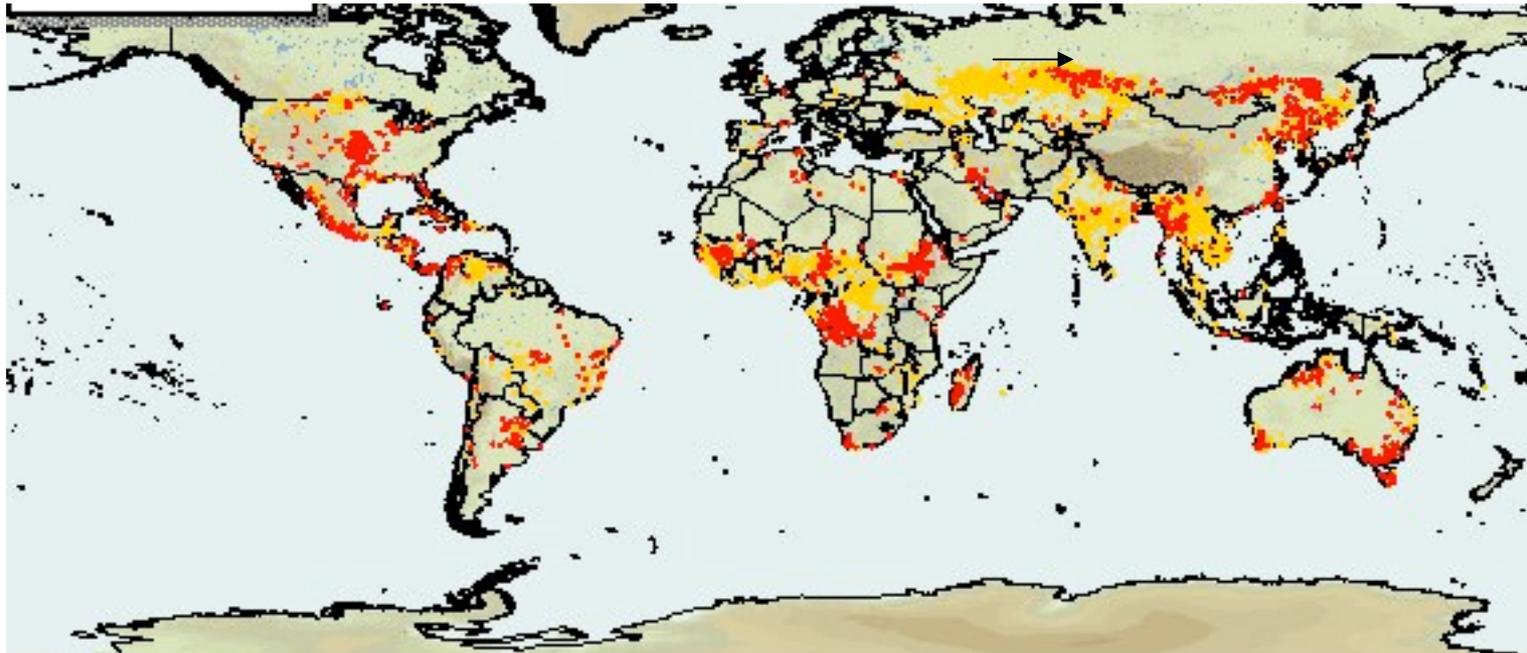
CO 500mb 20080415 Full



CONTACT: Dr. Juying Warner <juying@umbc.edu>; ACKNOWLEDGEMENT: AIRS NRT products by NASA DAAC

- Transport from the European side into the Arctic circle
- Asian Transport increases due to largely biomass burning events.

MODIS Global Active Fire Count Map In Last 7 days)
(20080406 - 20080413)

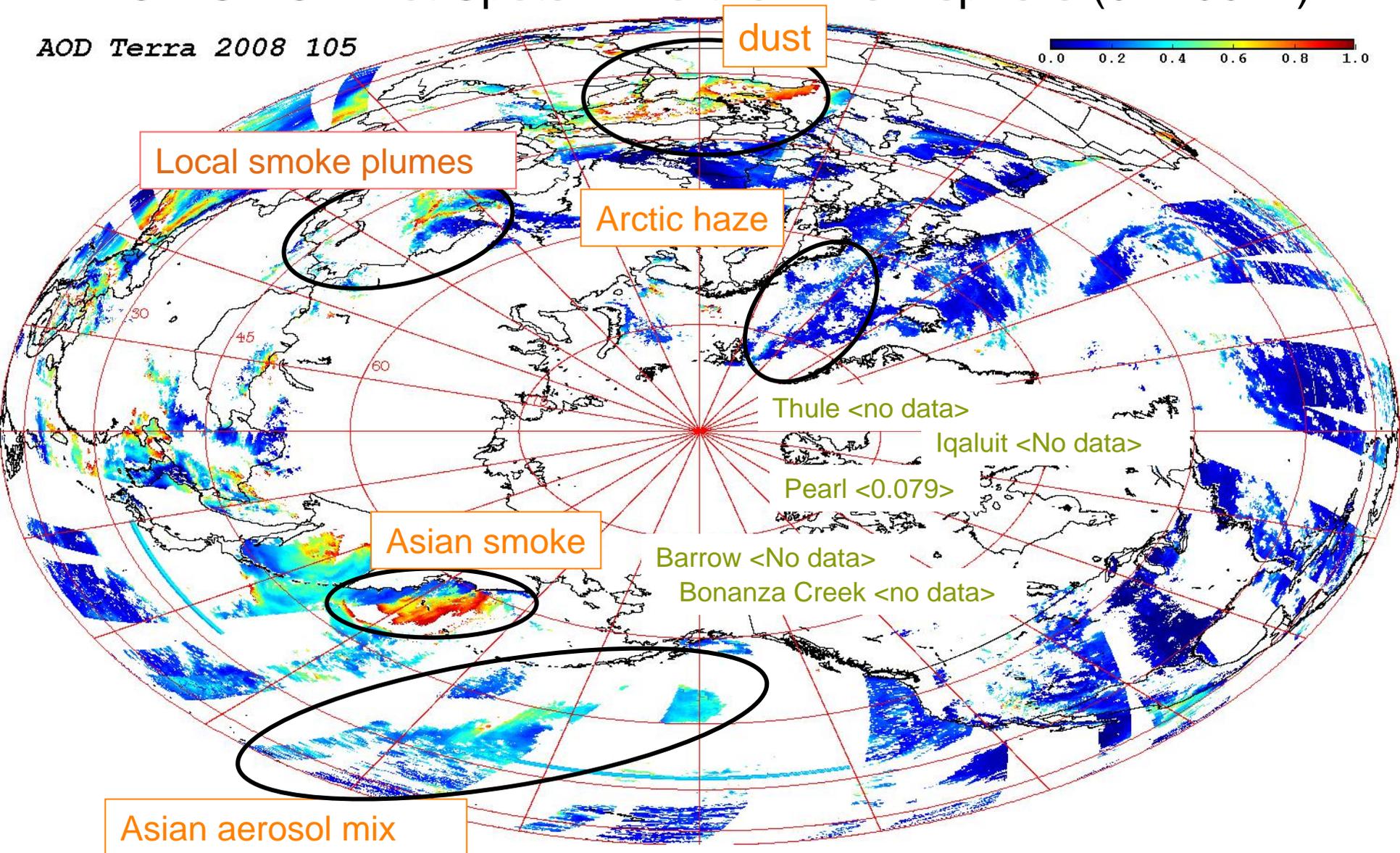


Fresh fires (superimposed in red) have started to diminish in central Asia but are still going strong in southeastern Siberia/northeastern China

Day 105 (April 14) Monday

MODIS AOD Hot Spots in Northern Hemisphere (0° - 90°N)

AOD Terra 2008 105

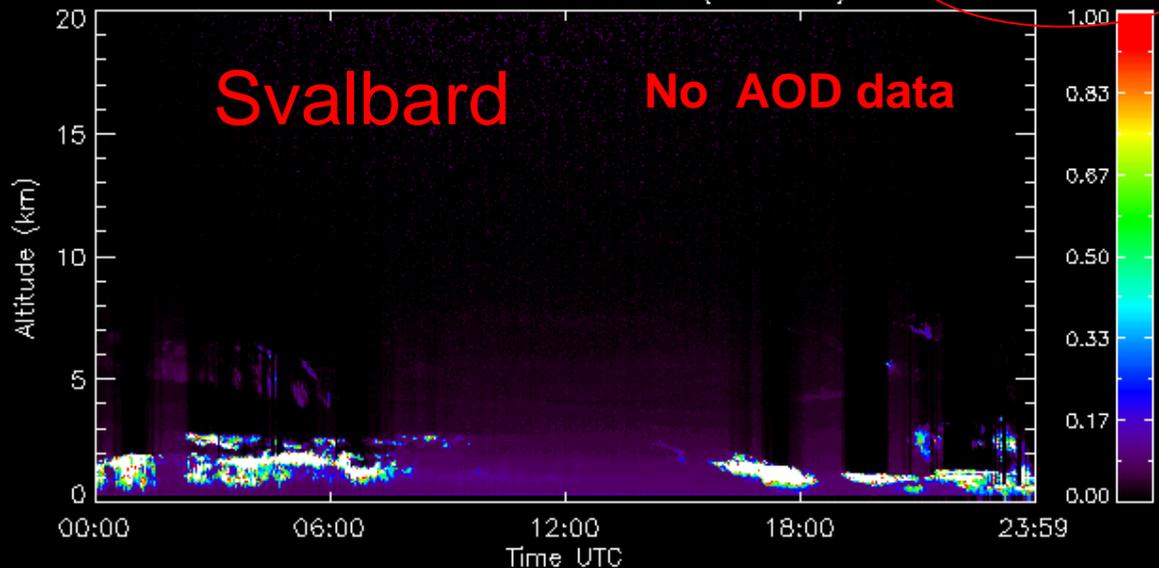


MODIS AOD at 550 nm and AERNOET daily mean <AOD> at 500 nm

MPLNET Level 1.0 Data: Ny_Alesund 20080414 (v0, MPL30010)
 Normalized Relative Backscatter (523.0 nm)

Caution:
 Preliminary Data

Svalbard No AOD data



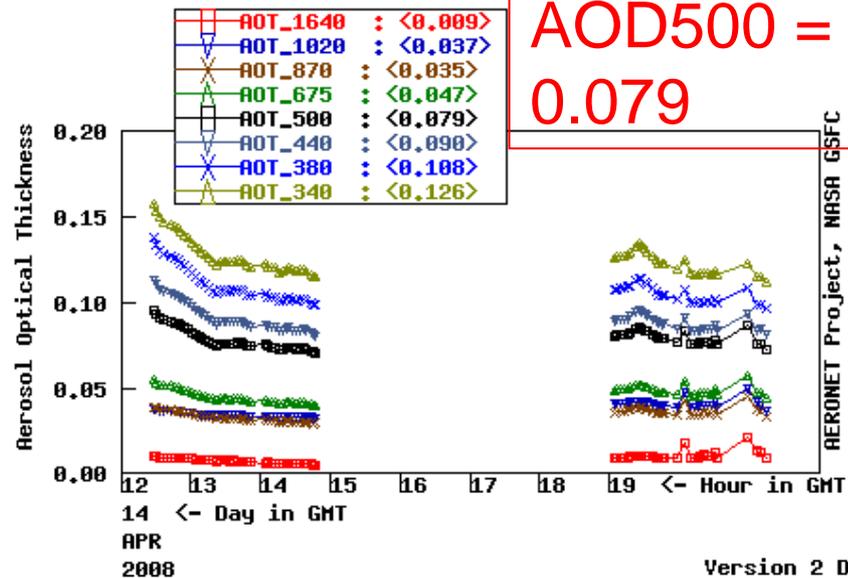
PEARL

PEARL, N 80°03'14", W 86°25'01", Alt 615 m,
 PI: Norm O'Neill, norm.oneill@USherbrooke.ca
 Level 1.5 AOT; Data from 14 APR 2008

AOD500 =
 0.079

Enhanced AOD in N. Amer. Arctic
 is gone.

Still see some enhancement on
 the European - Asian side
 (from MODIS)

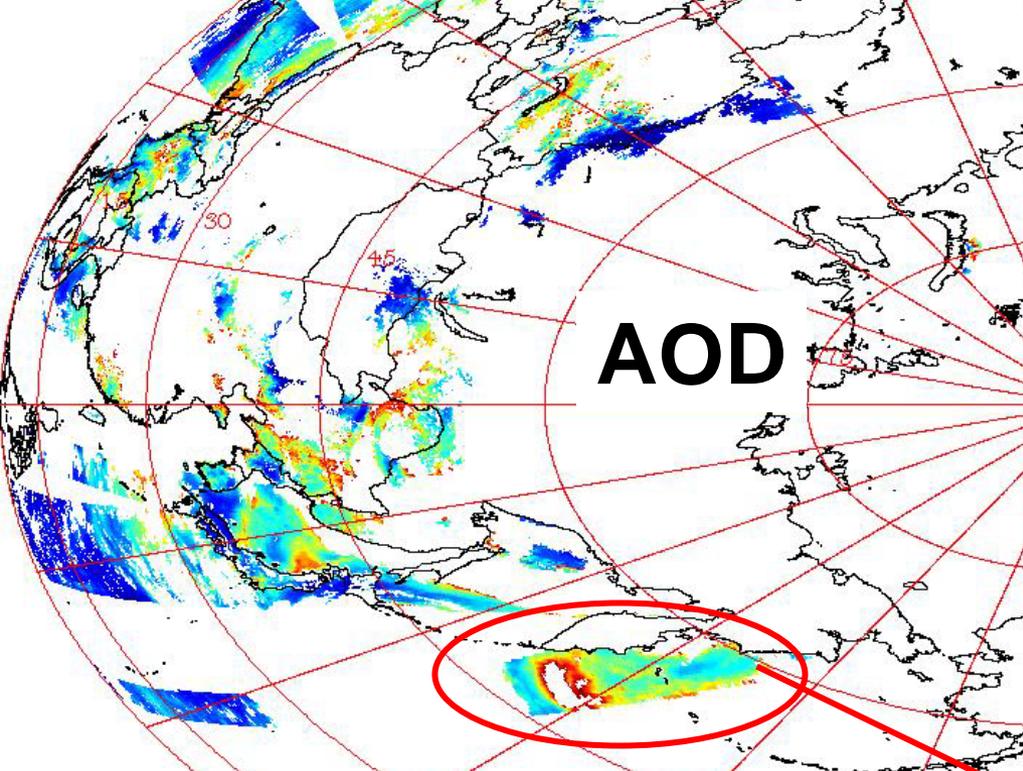


AERONET Project, NASA GSFC

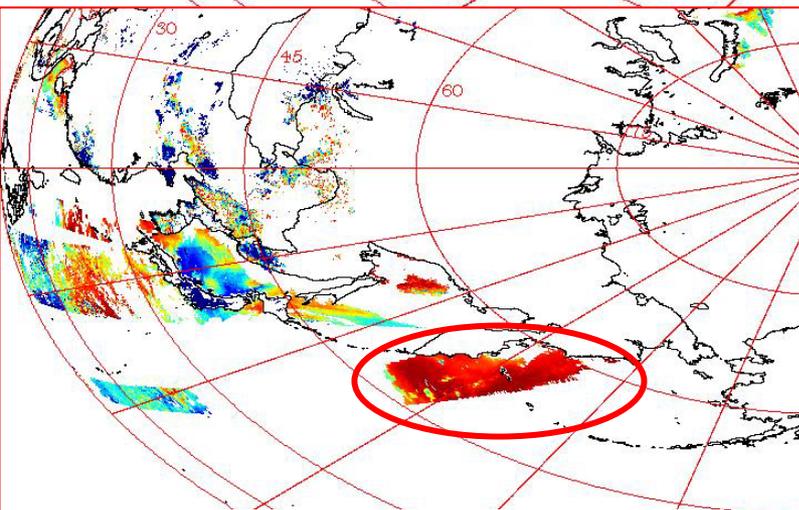
TODAY.
Tuesday April 15

Biomass burning plume
From fire flare-up over weekend

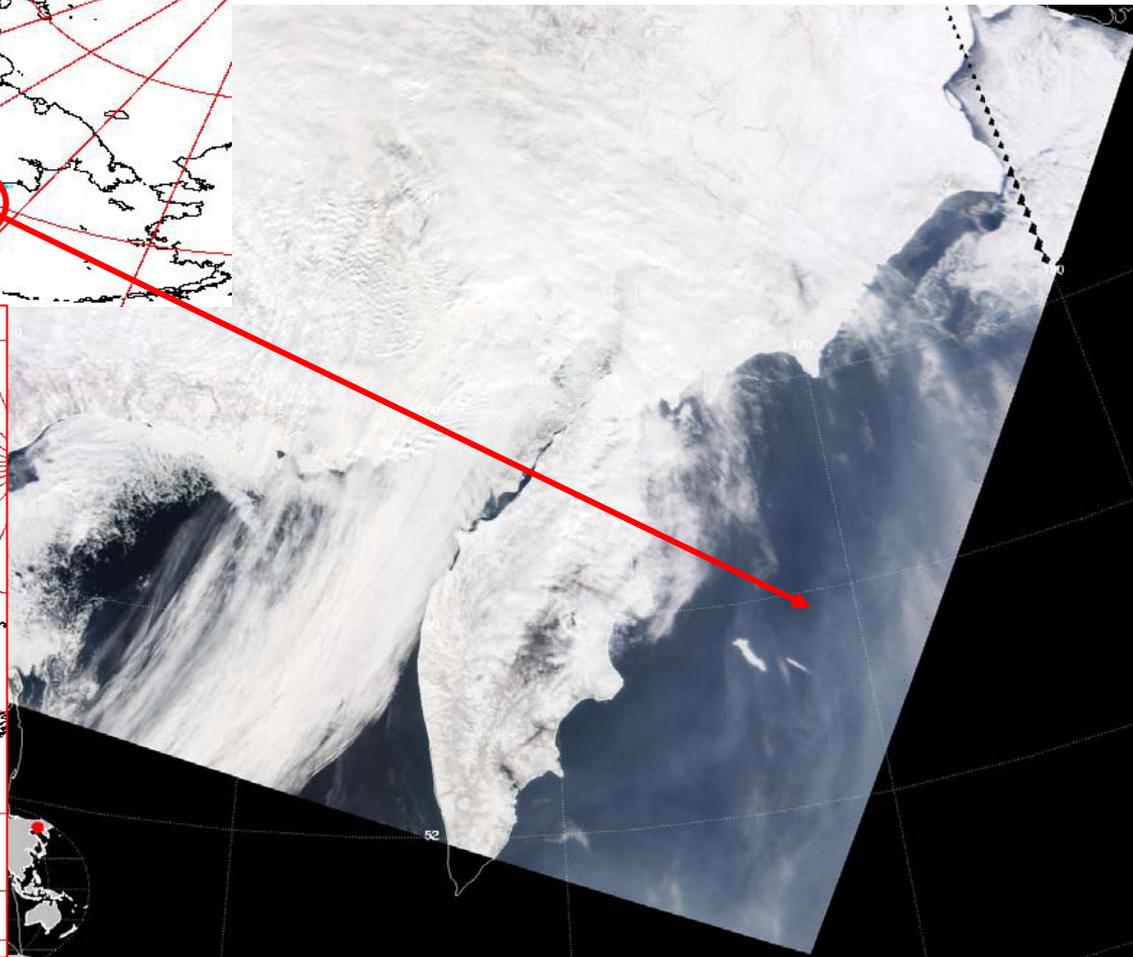
Notice $f_{mf} = 1$ >> dominated by
Small particles



AOD



Fine mode fraction



CALIPSO Observations

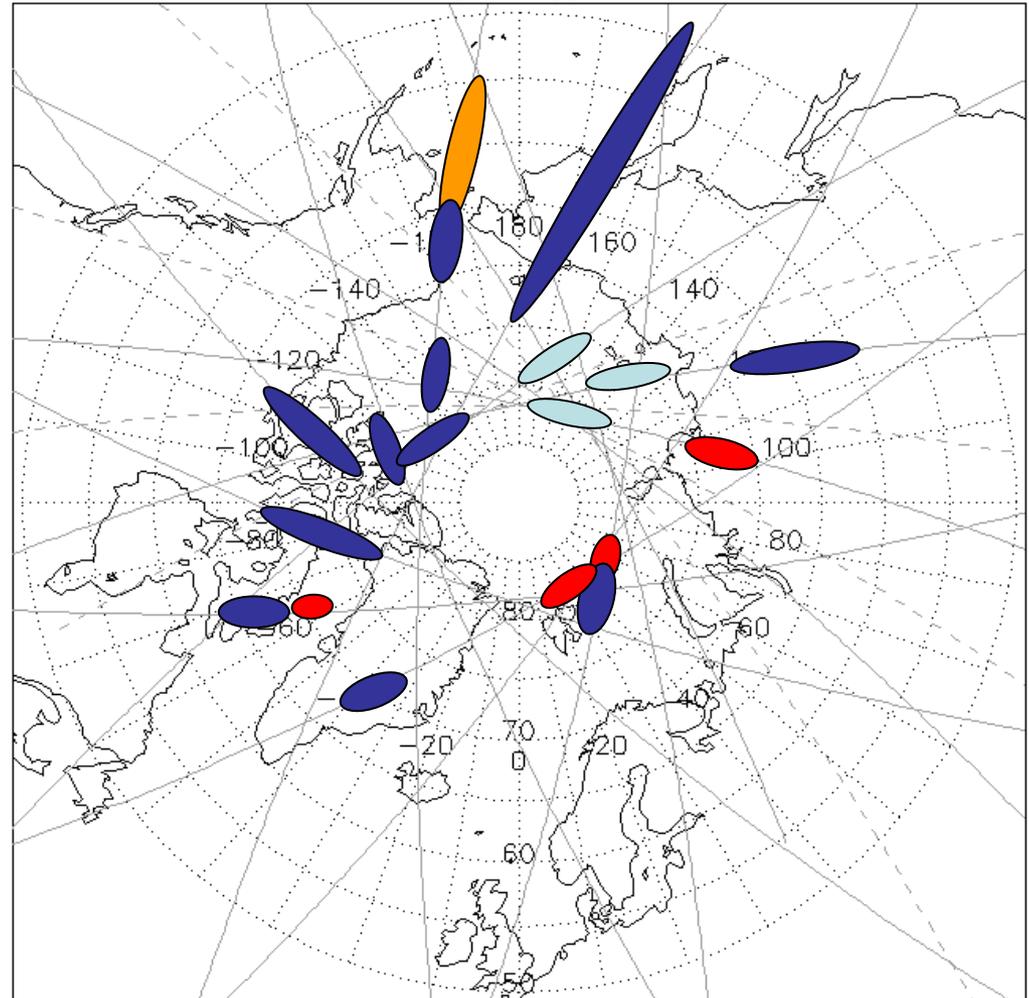
13/14 April 2008

CALIPSO Hot Spots – 13/14

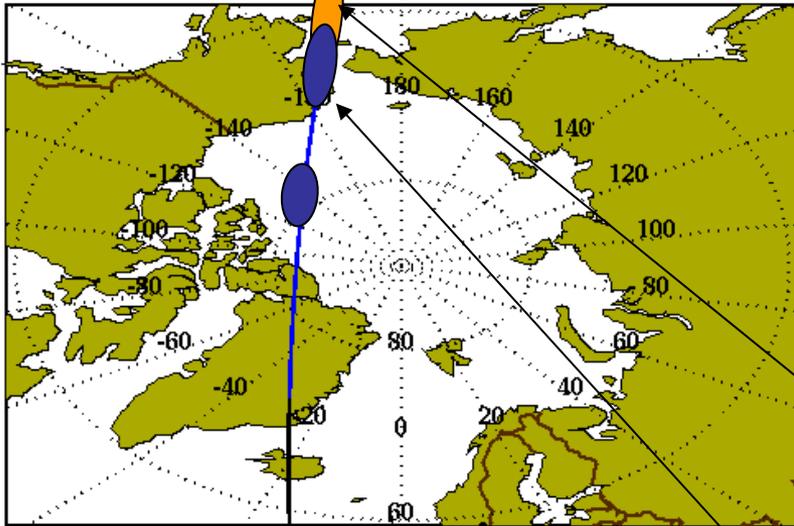
20080413(>18Z)/20080414

Color key

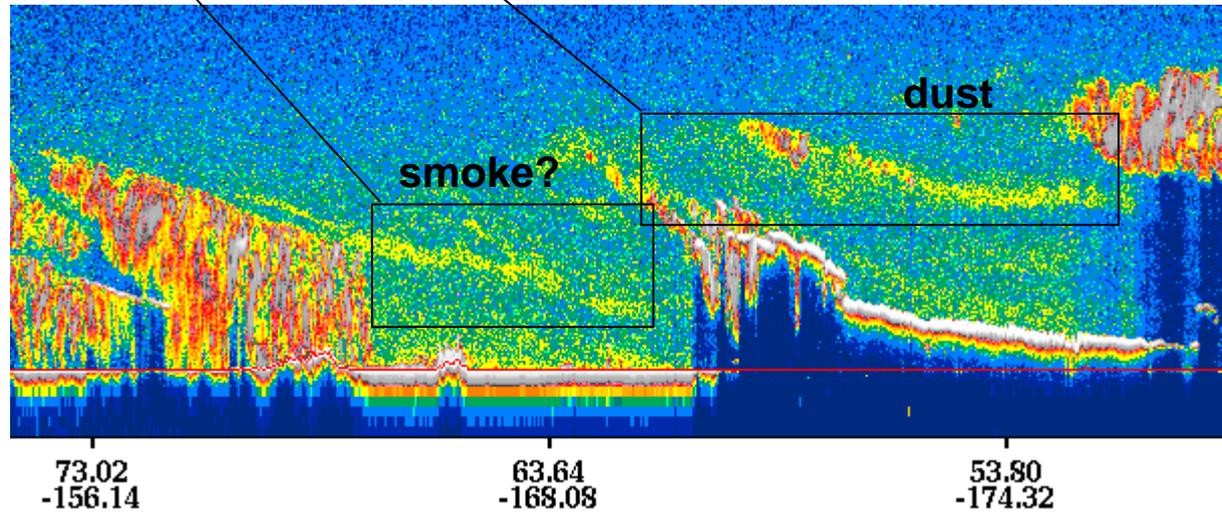
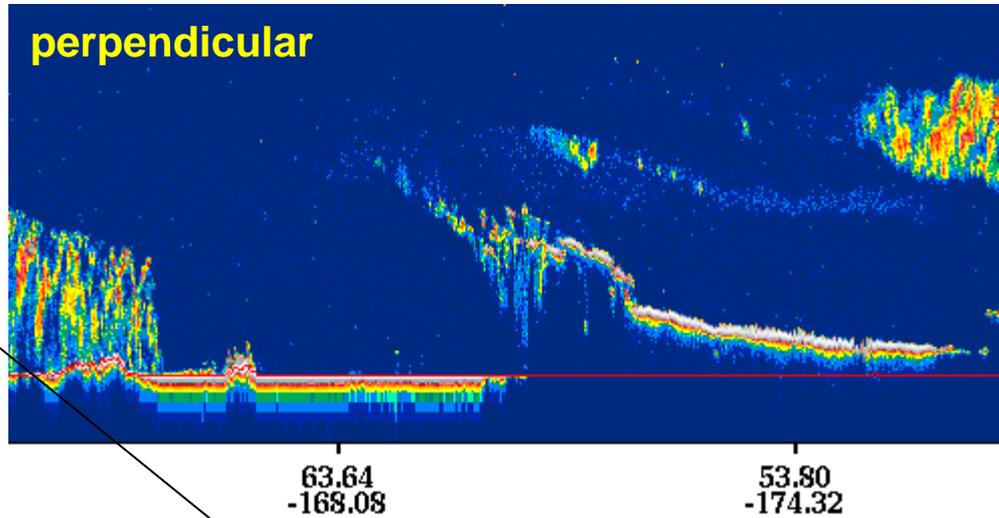
- distinct layer at surface
- distinct layer aloft
- weak, diffuse aerosol
- high depol (dust)
- cloudy



2008-04-14 13:30:00 UTC Half of Hour Conditions
Version: 2.0 Image Date: 04/15/2008

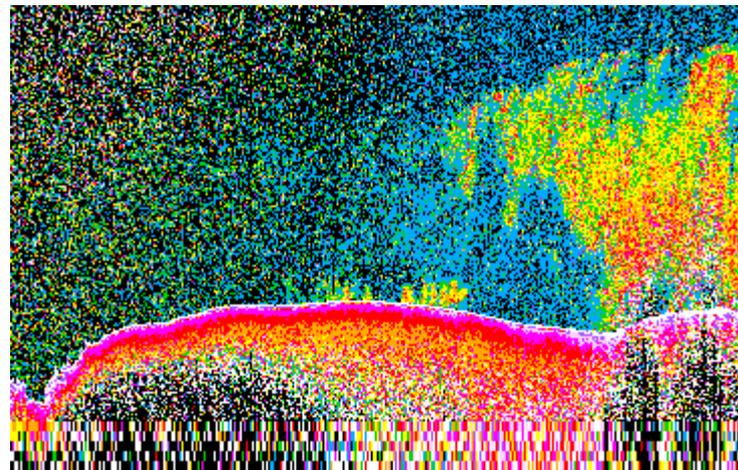
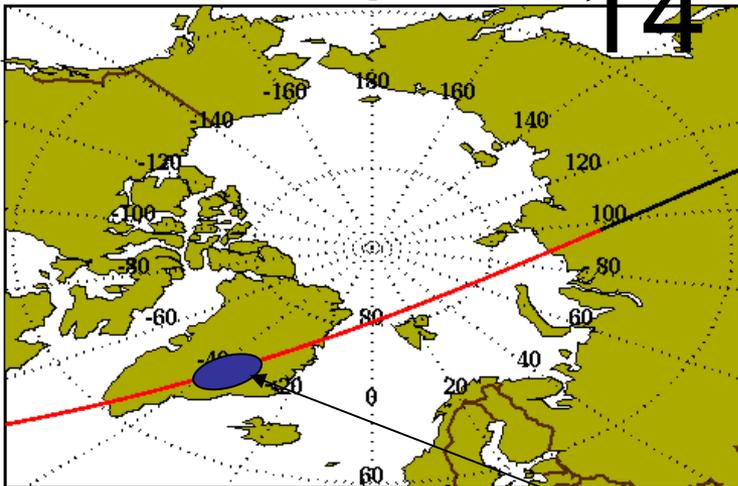


April 1330Z



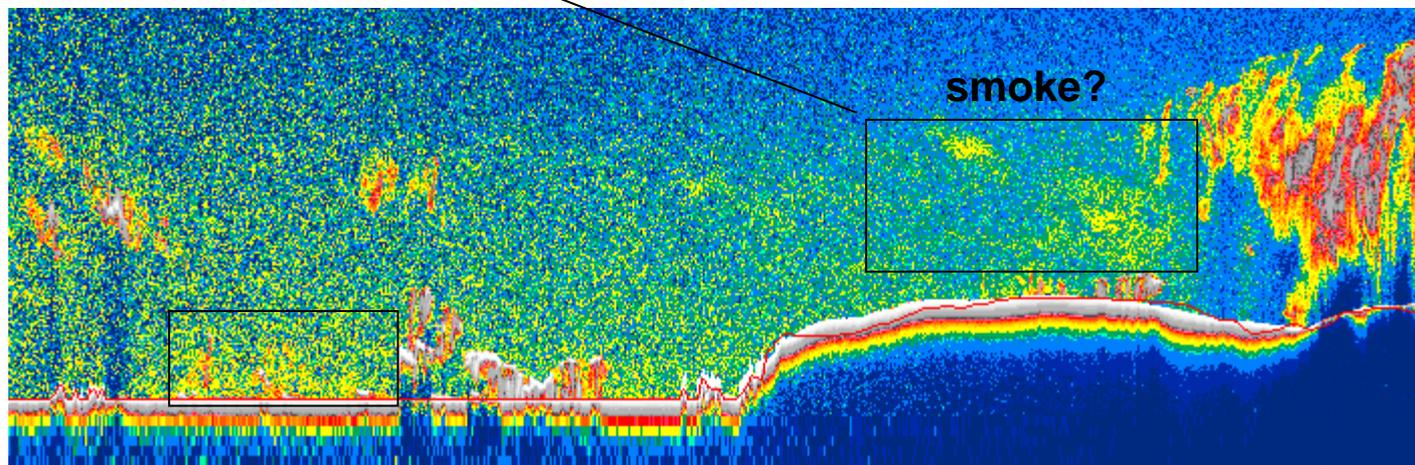
2008-04-14 04:30:00 UTC Half of Hour Conditions
Version: 2.01 Image Date: 04/15/2008

14 April 0430Z



74.29
-29.80

65.03
-43.26



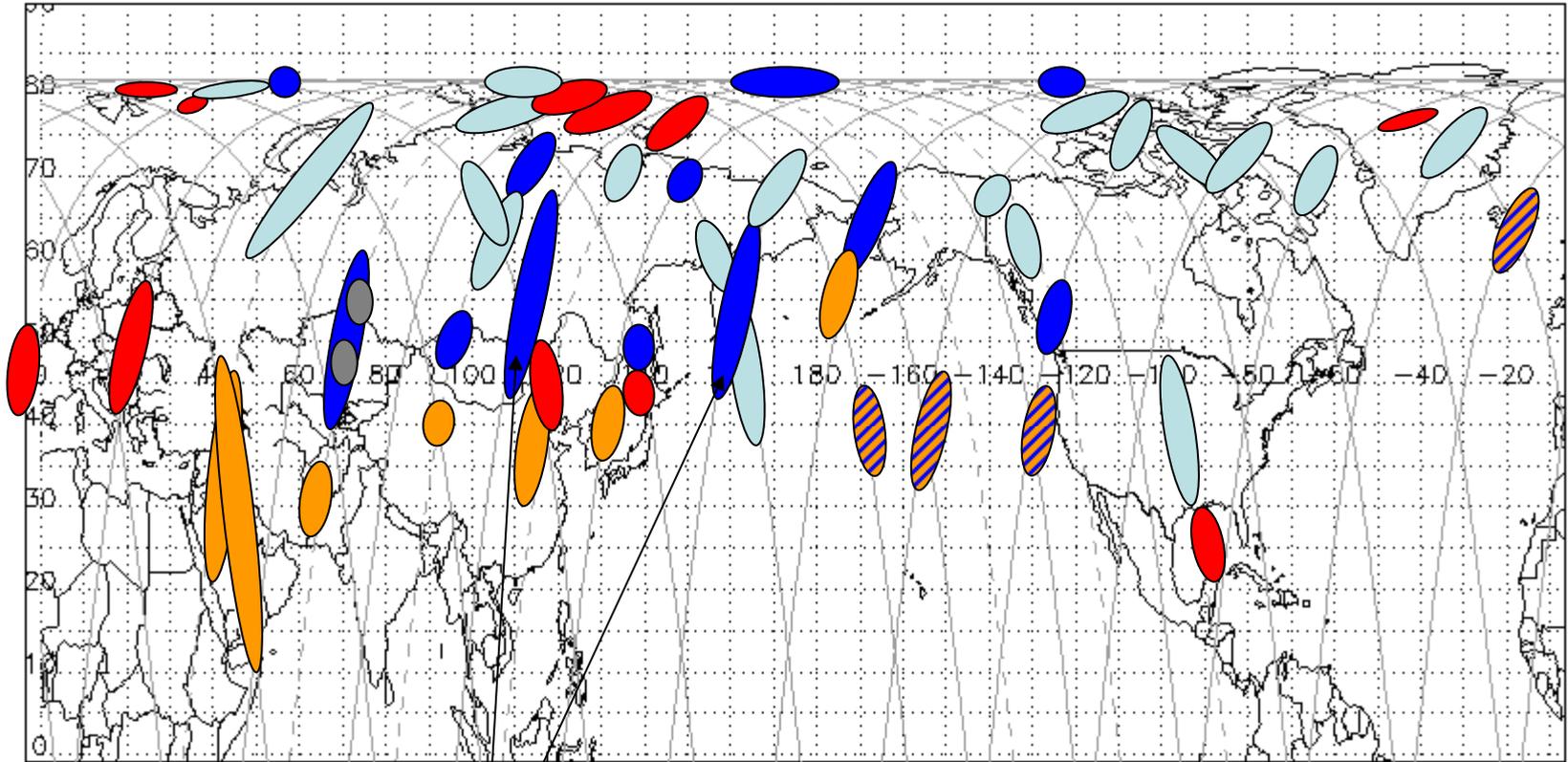
smoke?

81.20
8.42

74.29
-29.80

65.03
-43.26

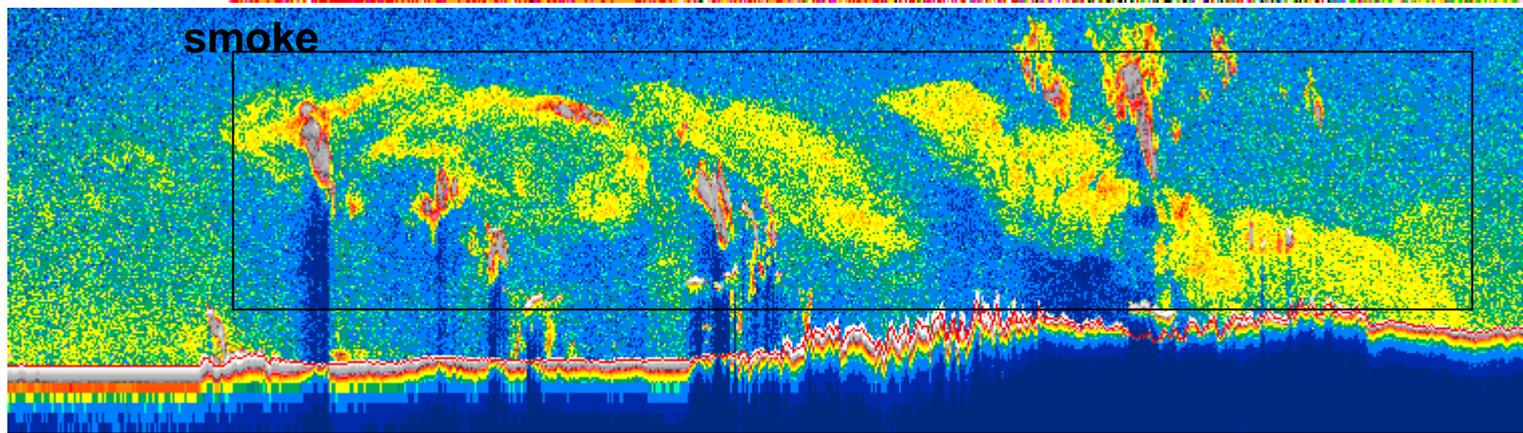
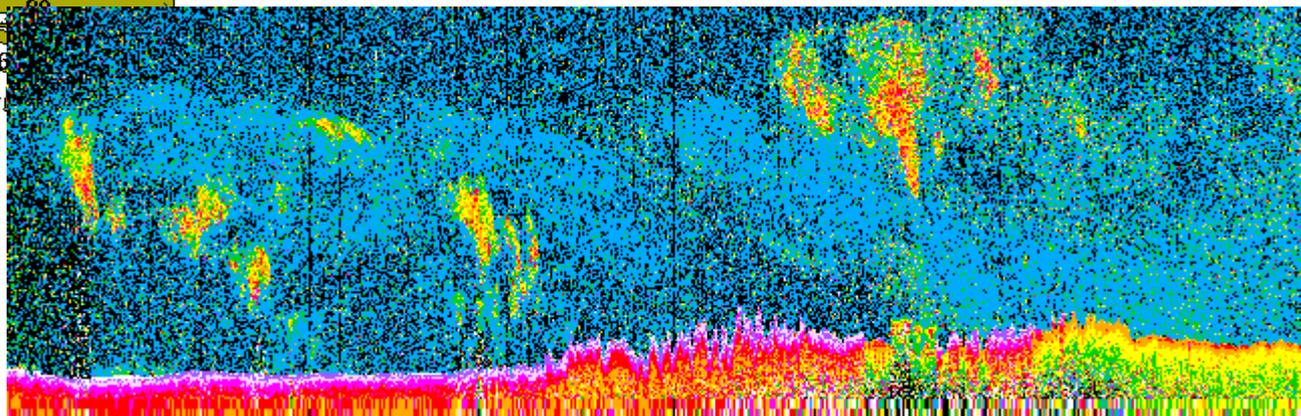
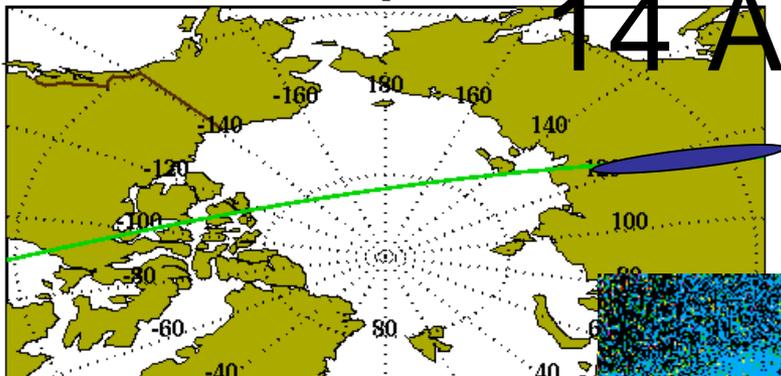
20080413(>18Z)/20080414



Huge smoke plumes

2008-04-14 18-00-00 UTC Start of Hour Conditions
Version: 2.01 Image Date: 04/15/2008

14 April 1800Z



68.26
122.36

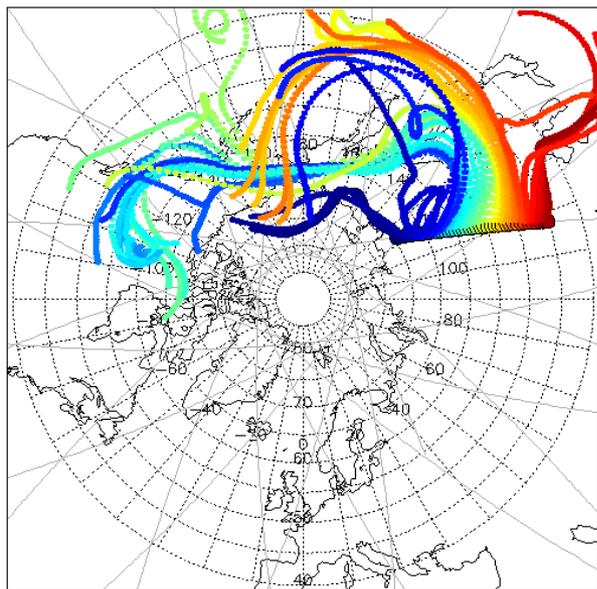
58.58
114.14

48.64
109.22

14 April 1800Z Granule

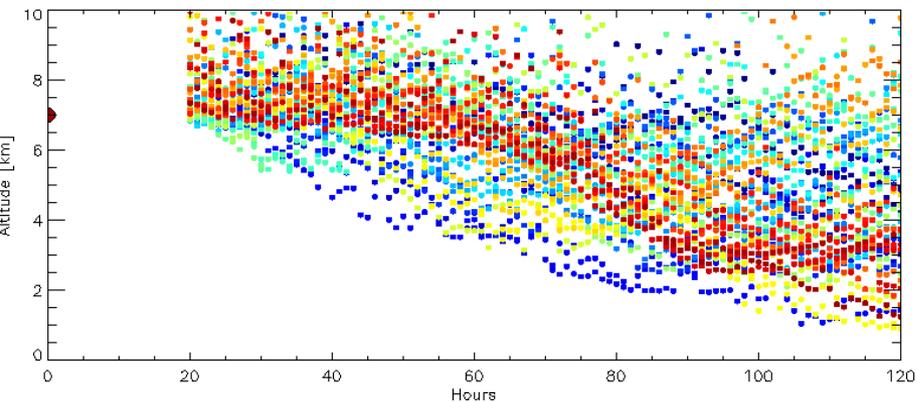
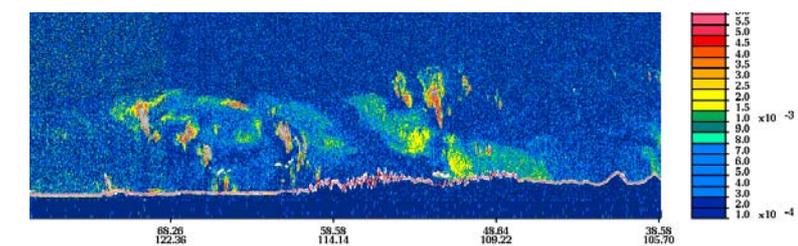
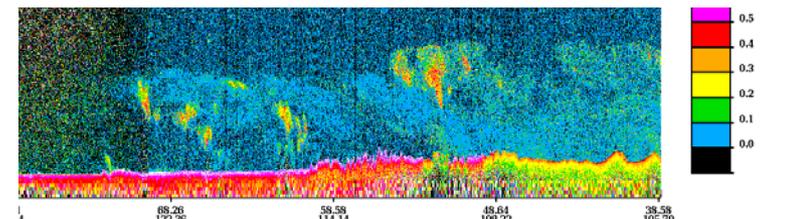
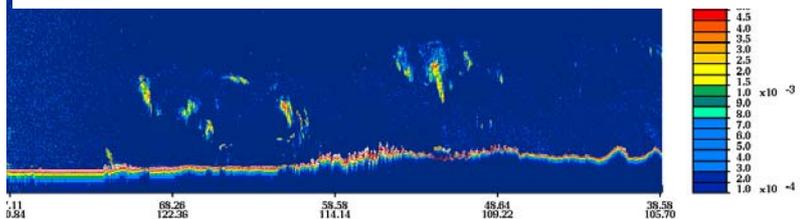
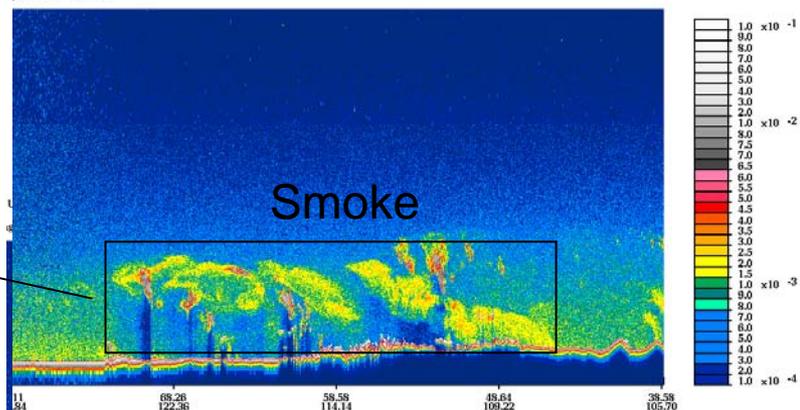
120hr CALIPSO Trajectories Initialized 2008041400 Valid 2008041900

Initial Altitude: 7000m



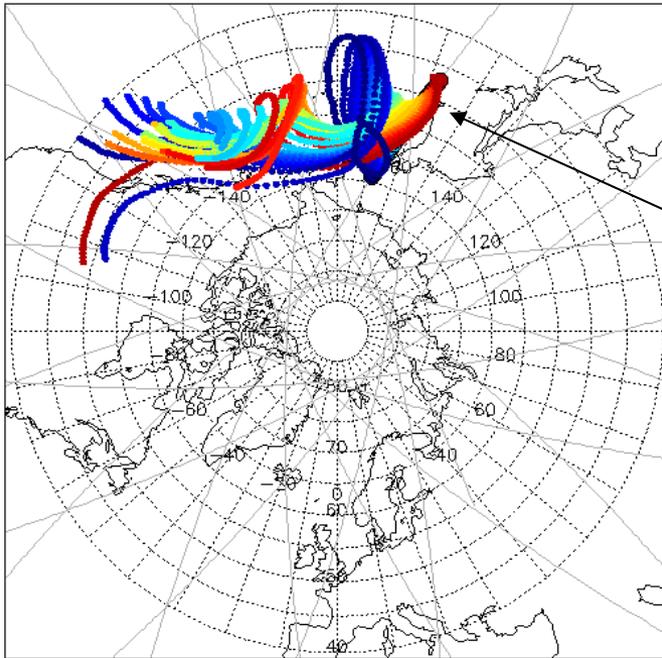
2008-04-14 18:45:09.0172 End UTC: 2008-04-14 19:07:42.2682

je Date: 04/15/2008

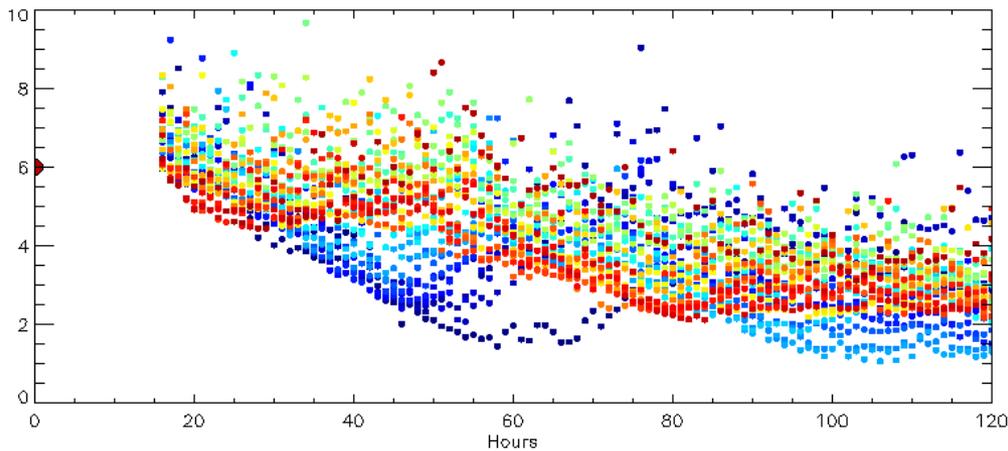
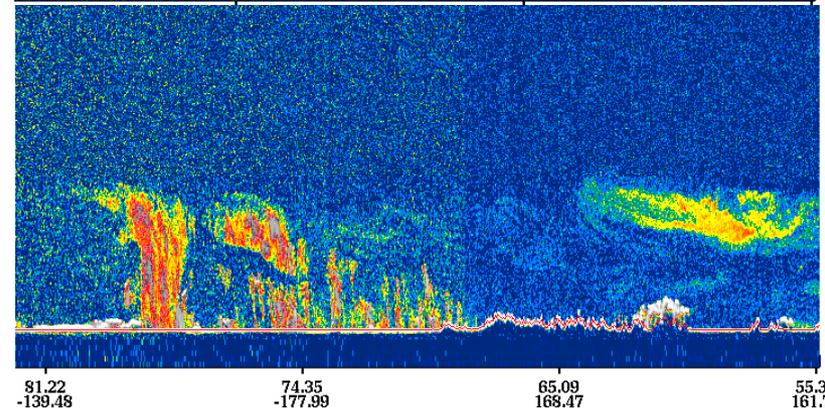
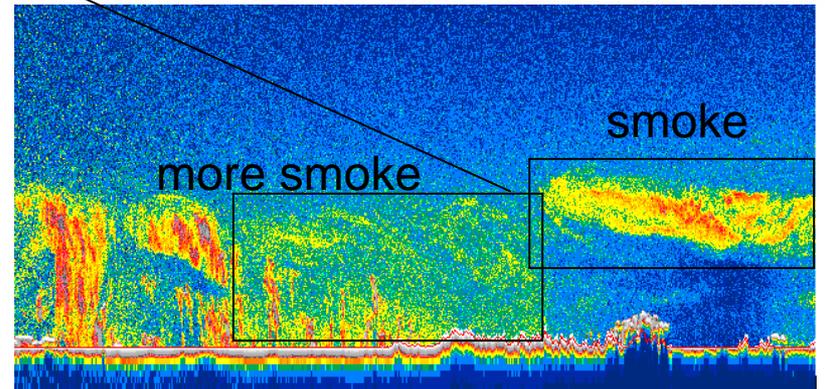
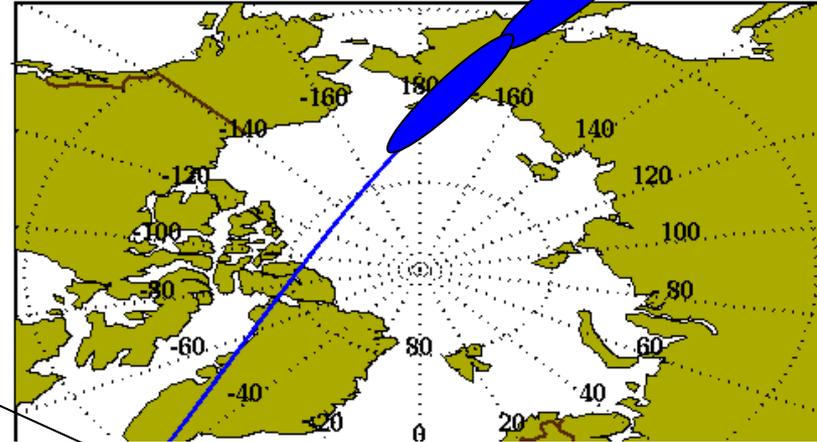


120hr CALIPSO Trajectories Initialized 2008041400 Valid 2008041900

Initial Altitude: 6000m

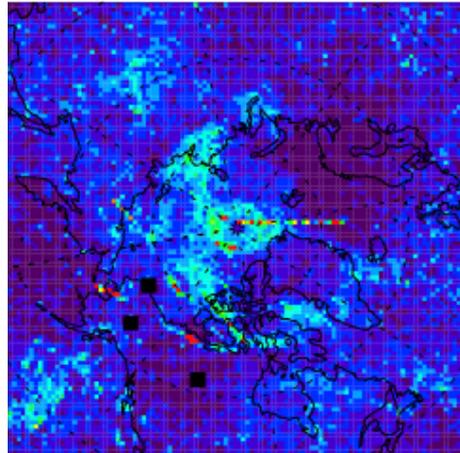


2008-04-14 15-00-00 UTC Start of Hour Conditions
Version: 2.01 Image Date: 04/14/2008

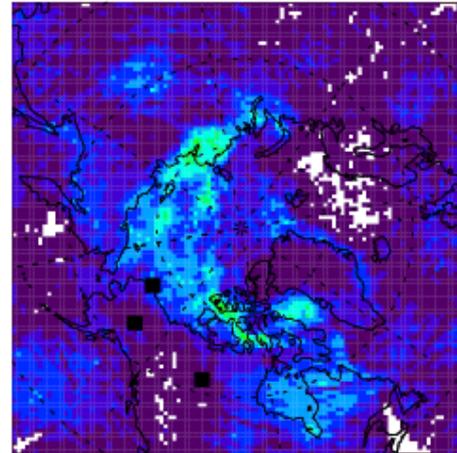


Boundary Layer BrO

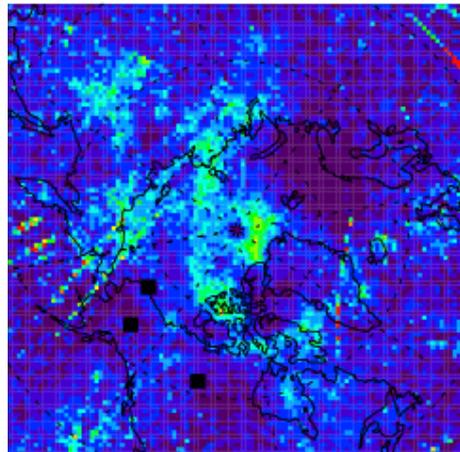
OMI_04-13



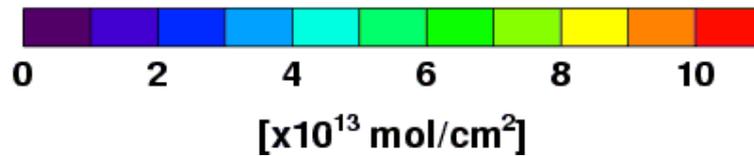
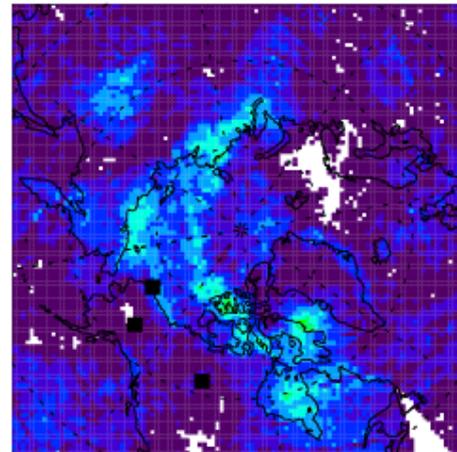
GOME2_04-13



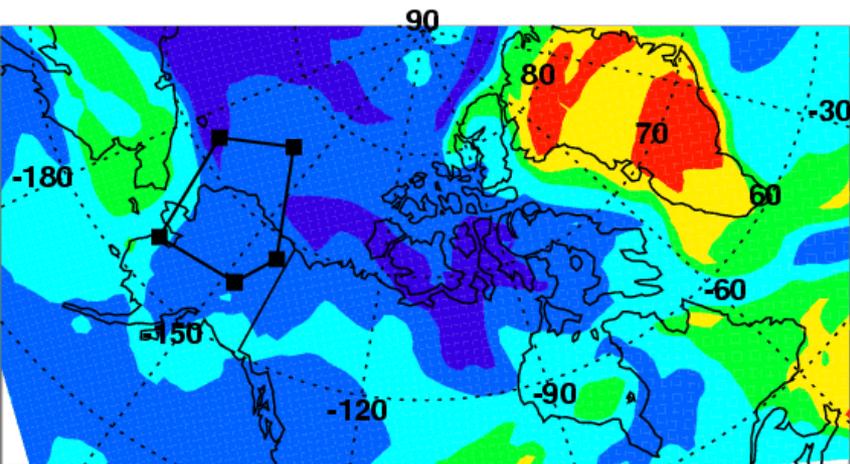
OMI_04-14



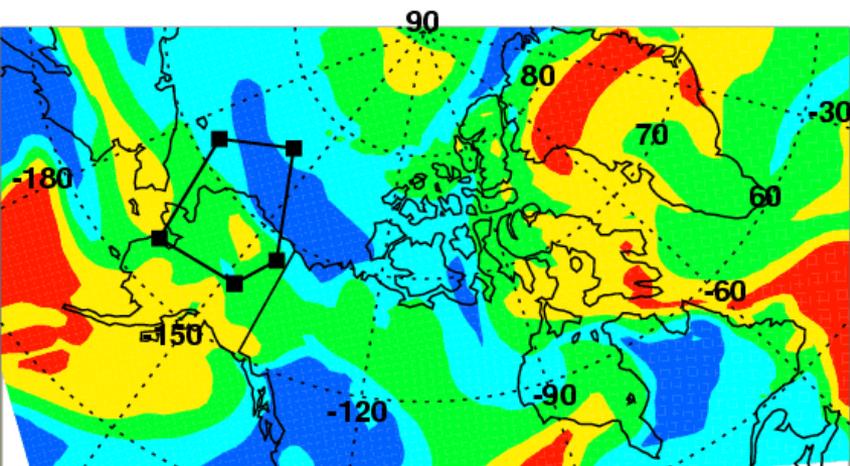
GOME2_04-14



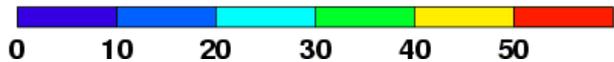
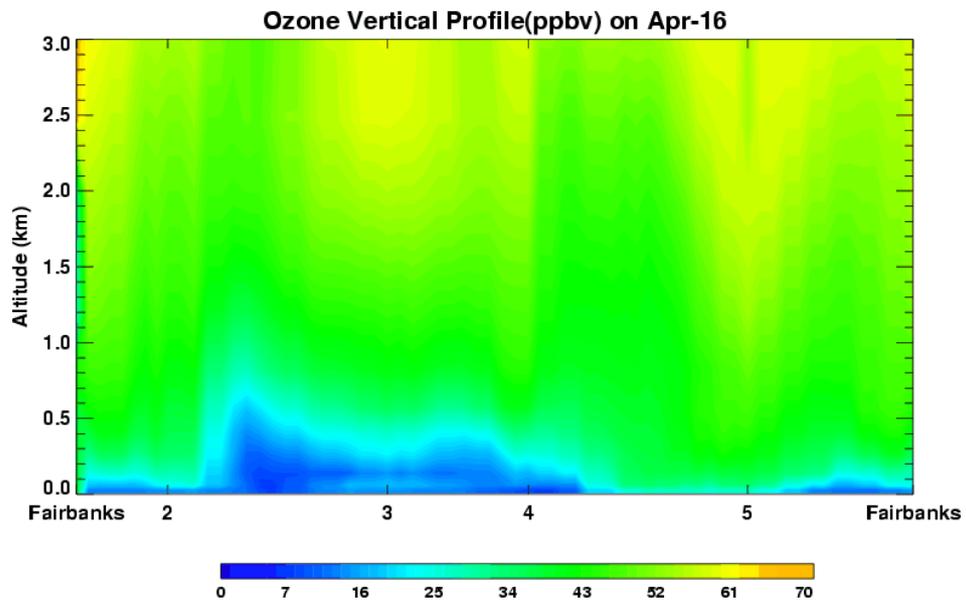
O₃ (ppbv) at surface, Apr-16_2000 UTC



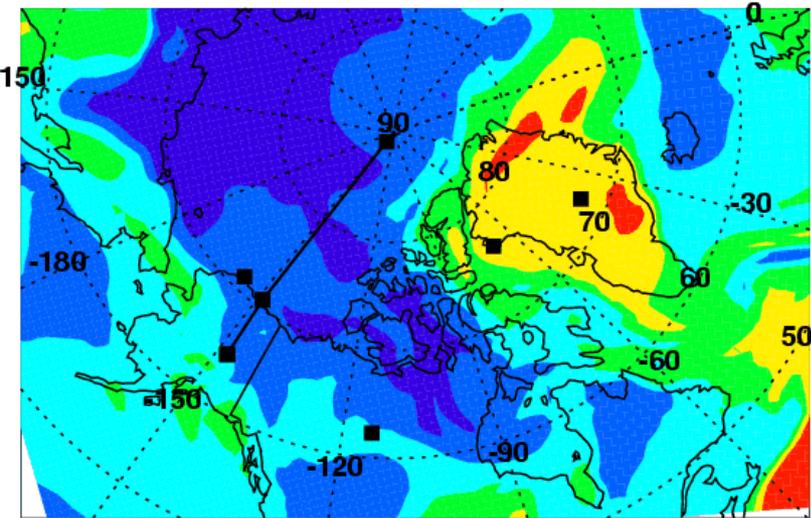
O₃ (ppbv) at 300m, Apr-16_2000 UTC



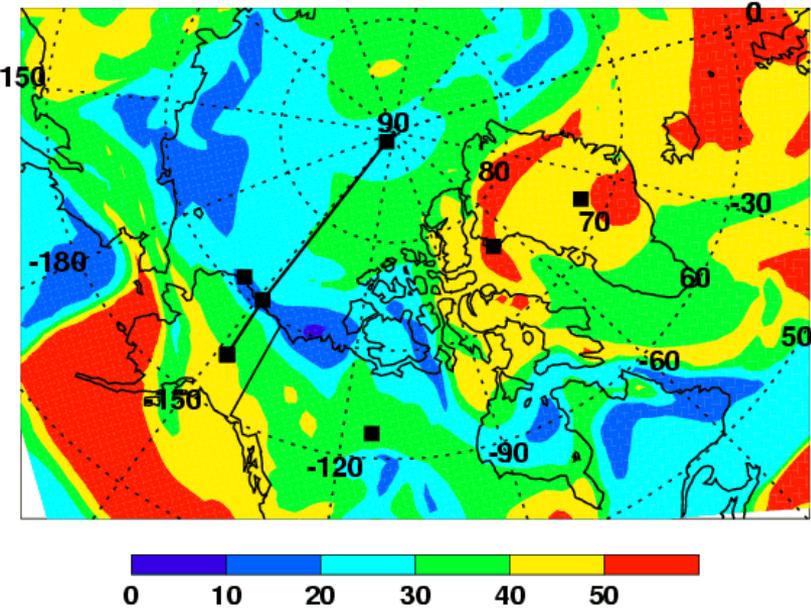
O₃ profile on 4/16



O₃ (ppbv) at surface, Apr-17_2000 UTC

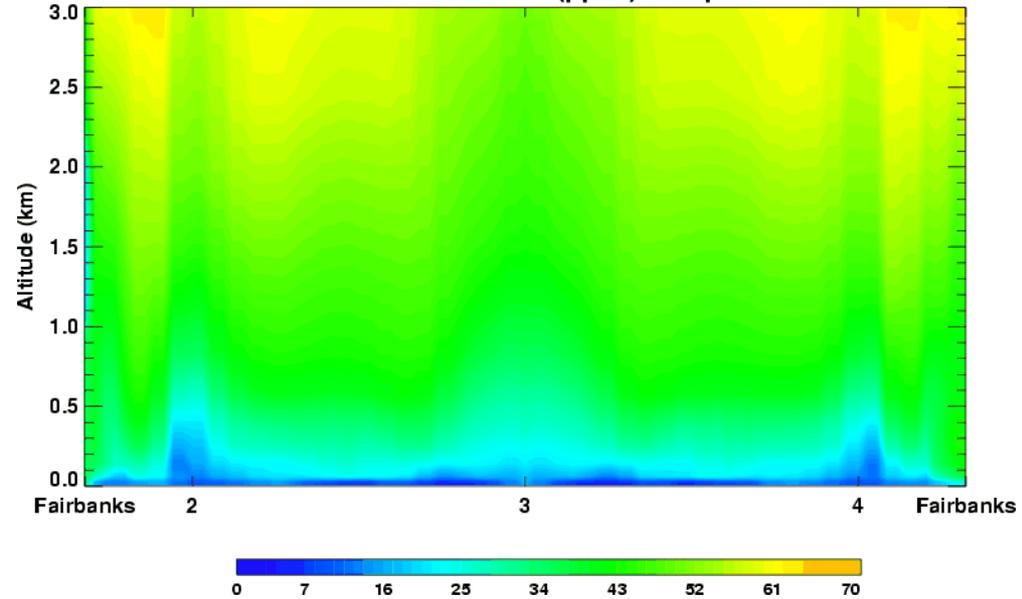


O₃ (ppbv) at 300m, Apr-17_2000 UTC



O₃ profile on 4/17

Ozone Vertical Profile(ppbv) on Apr-17

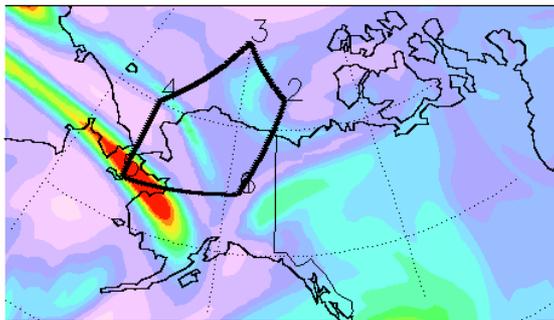


MZ4/GFS Apr 16 18Z

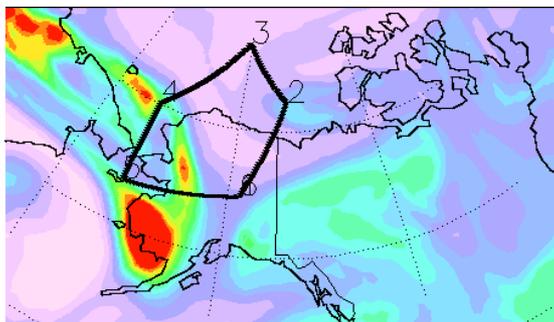
forecast from Apr 15

Alaska Loop – Fresh and Aged Asian Pollution

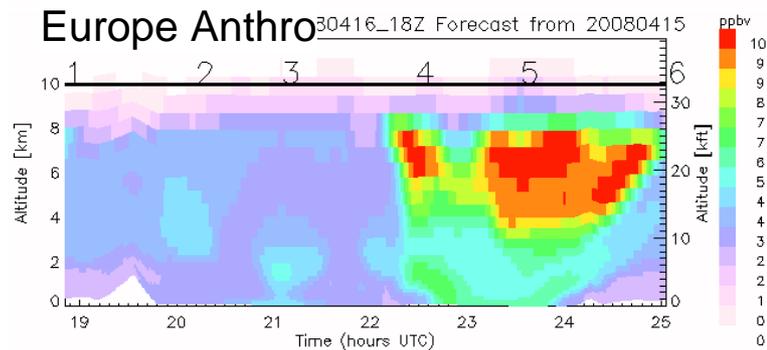
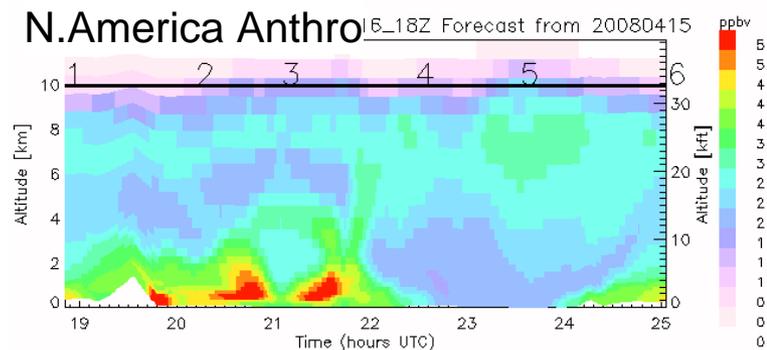
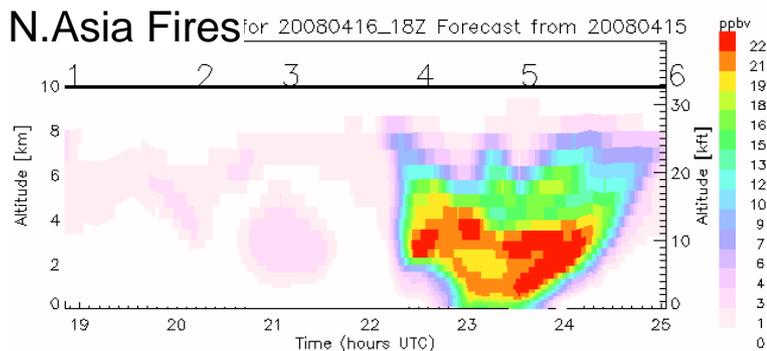
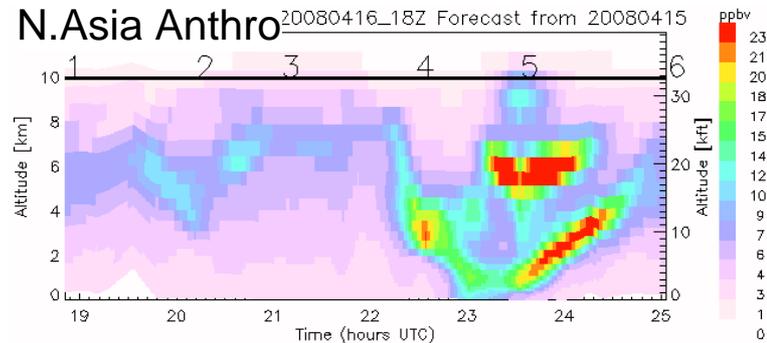
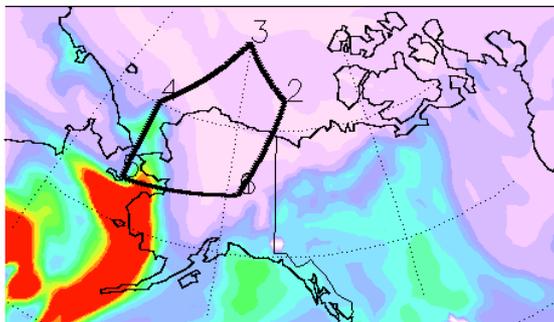
N.Asia Anthro 6 km_{416_18Z}



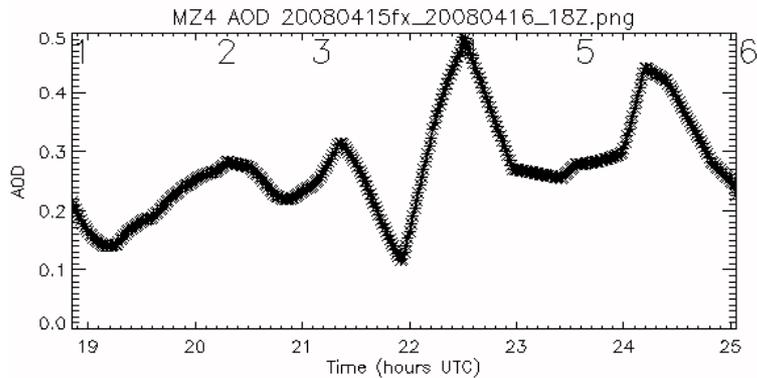
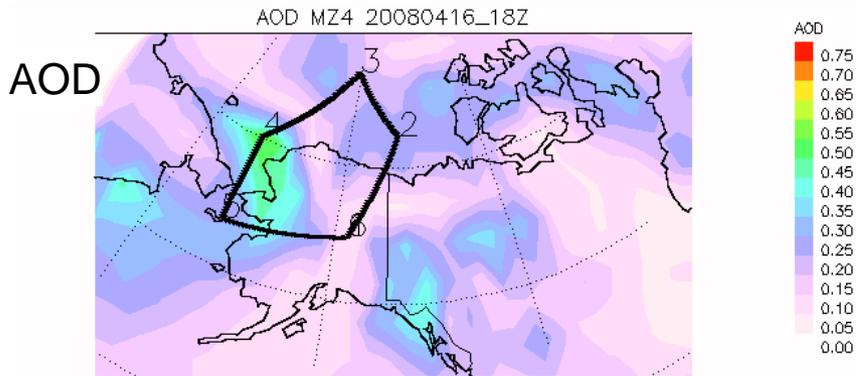
N.Asia Anthro 4 km_{416_18Z}



N.Asia Anthro 2 km_{30416_18Z}

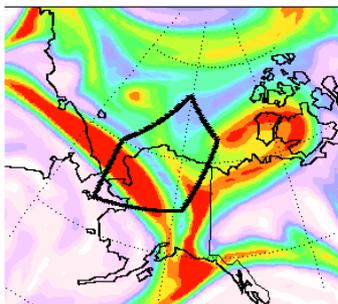


MZ4/GFS Apr 16 18Z forecast from Apr 15

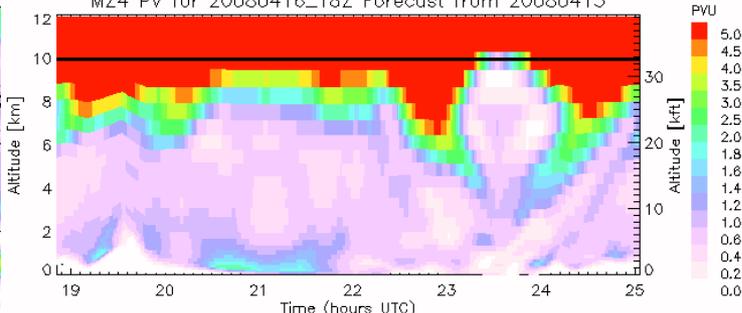


Potential Vorticity

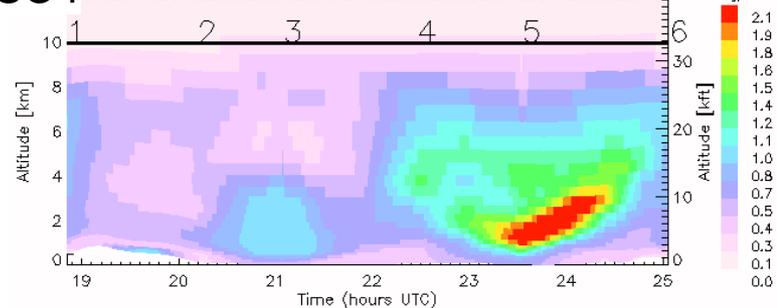
MZ4 PV 8 km 20080416_18Z



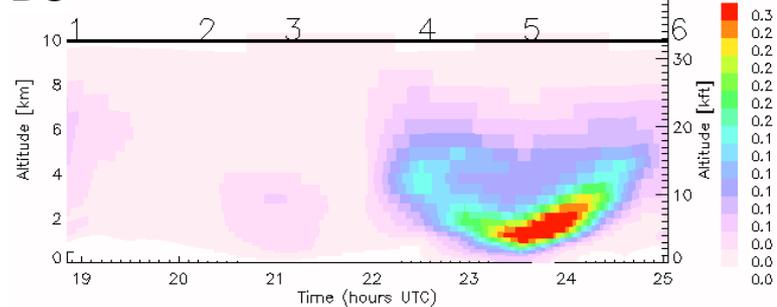
MZ4 PV for 20080416_18Z Forecast from 20080415



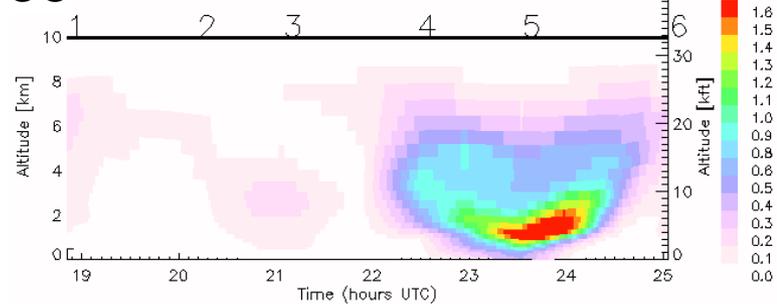
SO4 Z4-T42 SO4 for 20080416_18Z Forecast from 20080415



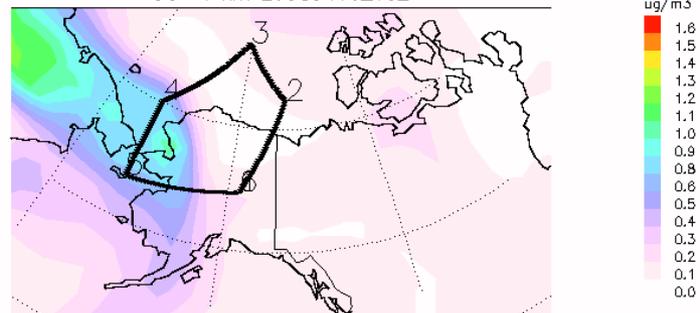
BC MZ4-T42 BC for 20080416_18Z Forecast from 20080415



OC MZ4-T42 OC for 20080416_18Z Forecast from 20080415



OC 4 km 20080416_18Z

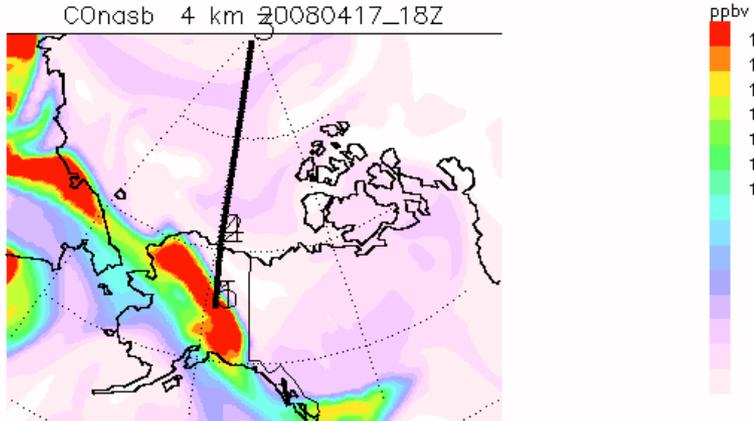


MZ4/GFS Apr 17 18Z

forecast from Apr 15
North Pole run

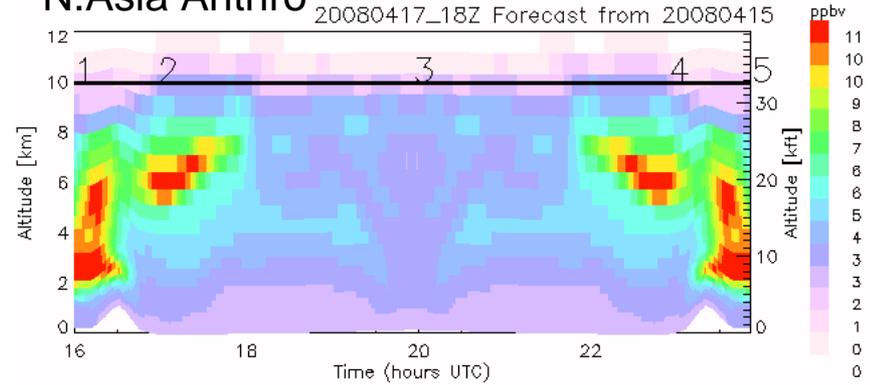
N.Asia Fires 4km

CO_{nasb} 4 km 20080417_18Z



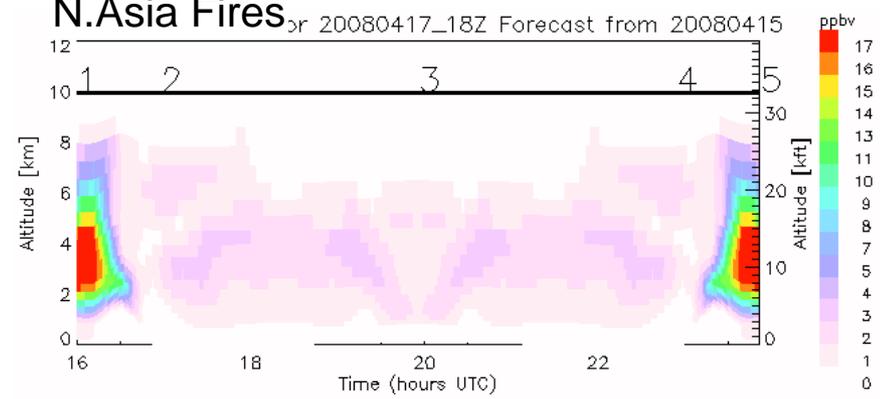
N.Asia Anthro

20080417_18Z Forecast from 20080415



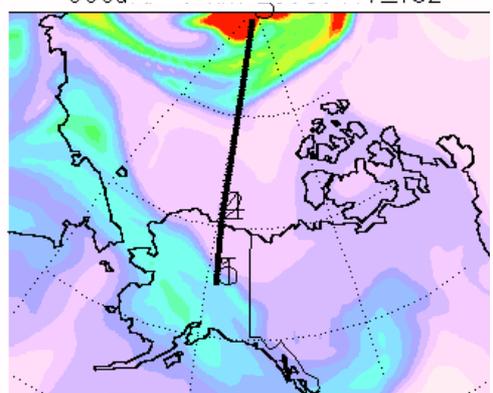
N.Asia Fires

20080417_18Z Forecast from 20080415



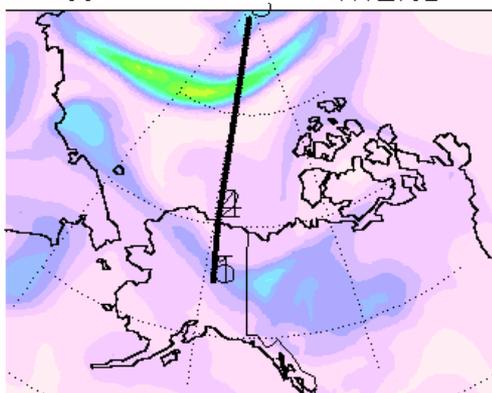
Europe 6km

CO_{eu} 6 km 20080417_18Z



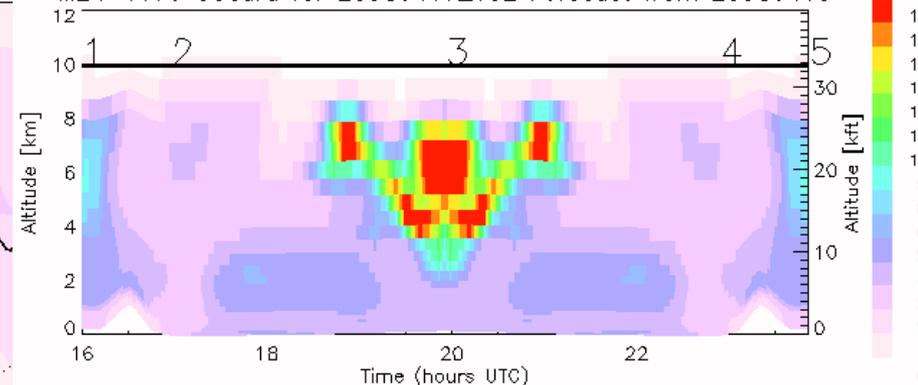
Europe 8km

CO_{eu} 8 km 20080417_18Z



Europe Anthro

MZ4-T170 CO_{eu} for 20080417_18Z Forecast from 20080415

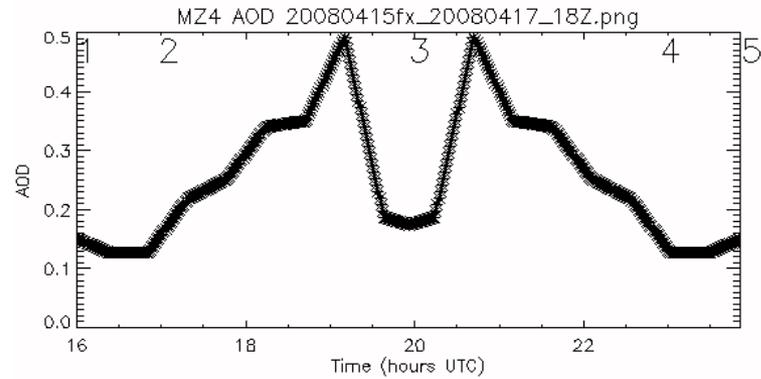
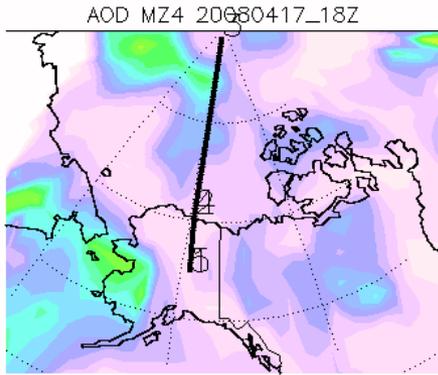


MZ4/GFS Apr 17 18Z

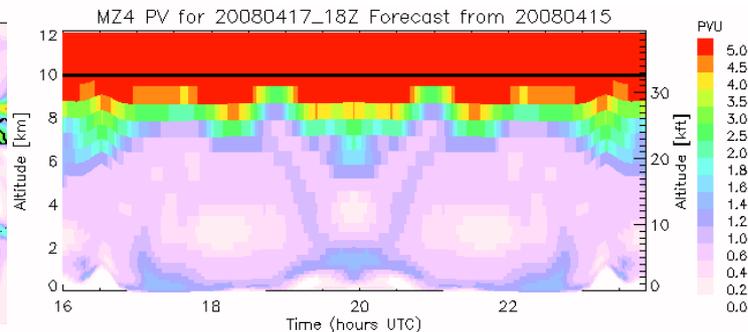
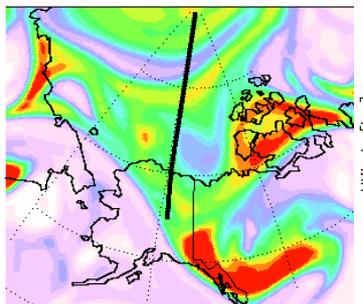
forecast from Apr 15

North Pole run

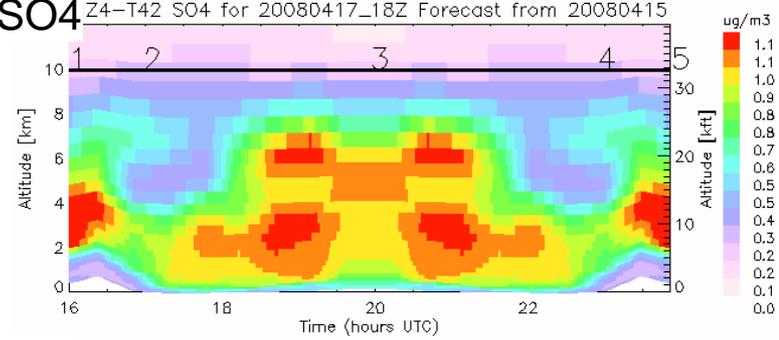
AOD



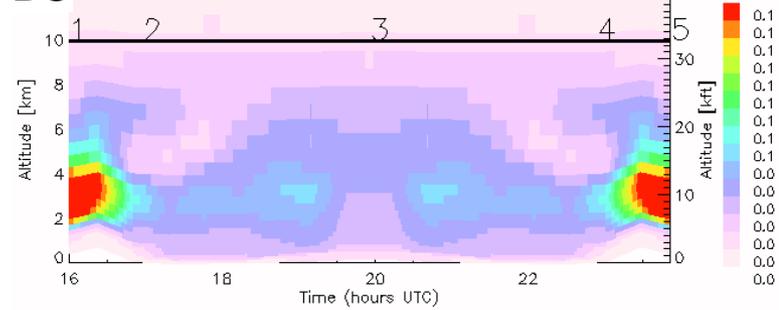
MZ4 PV 8 km 20080417_18Z



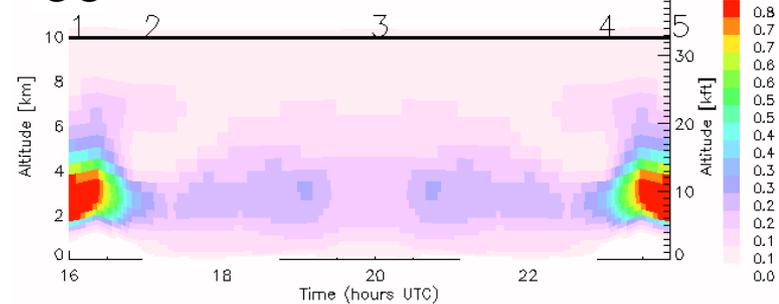
SO4 Z4-T42 SO4 for 20080417_18Z Forecast from 20080415



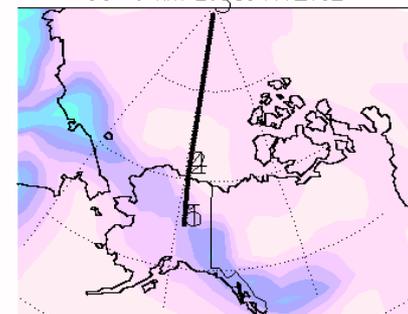
BC MZ4-T42 BC for 20080417_18Z Forecast from 20080415



OC 4-T42 OC for 20080417_18Z Forecast from 20080415



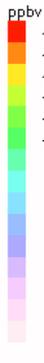
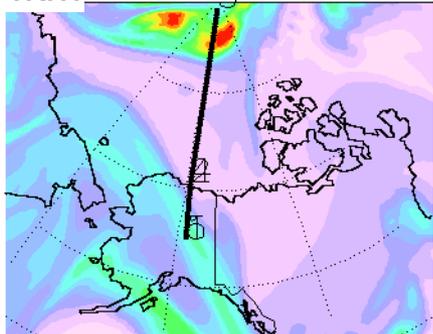
OC 6 km 20080417_18Z



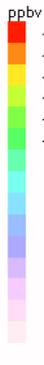
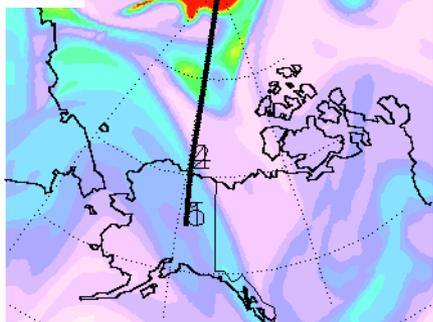
MZ4/GFS Apr 18 18Z

forecast from Apr 15
North Pole run

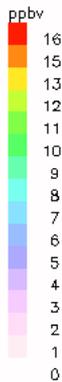
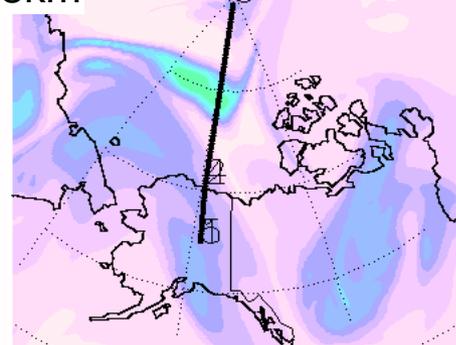
Europe 4km eura 4 km 20080418_18Z



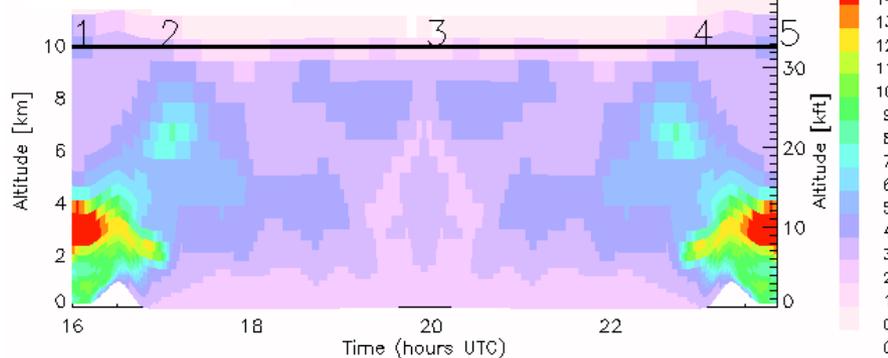
Europe 6km eura 6 km 20080418_18Z



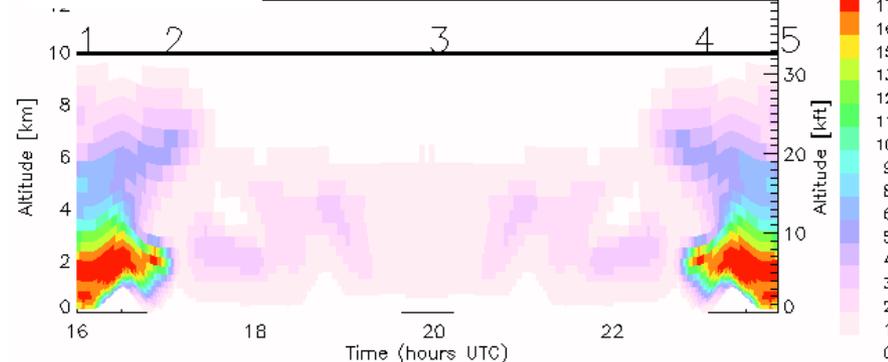
Europe 8km eura 8 km 20080418_18Z



N.Asia Anthro for 20080418_18Z Forecast from 20080415

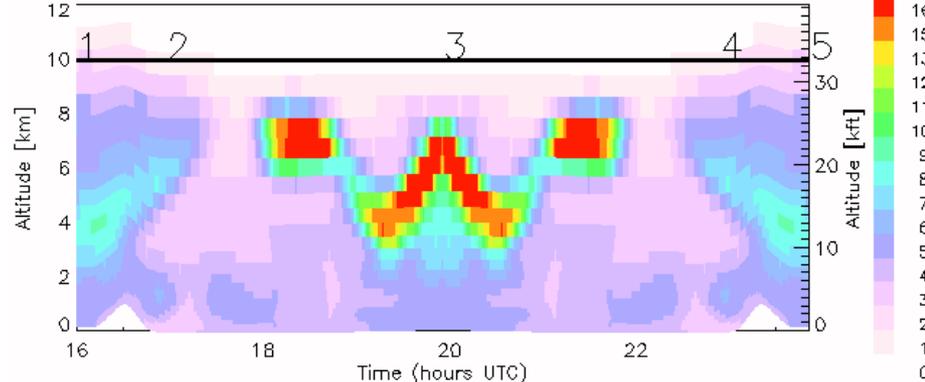


N.Asia Fires for 20080418_18Z Forecast from 20080415



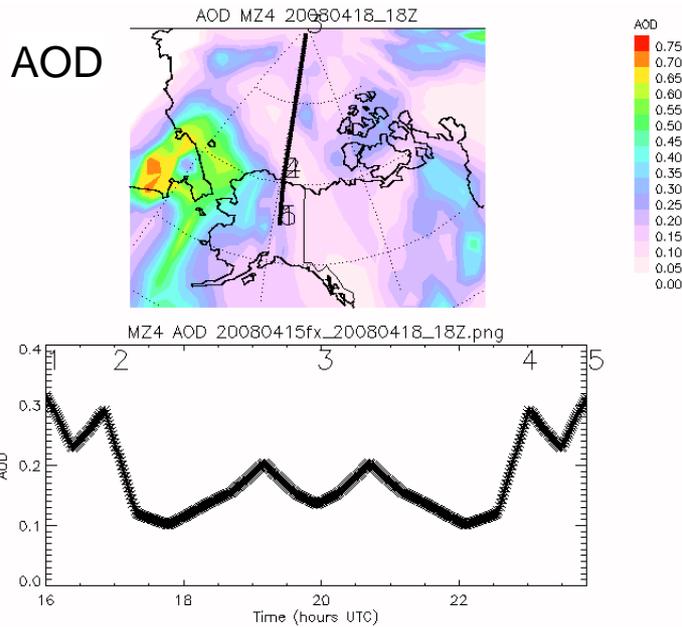
Europe Anthro

MZ4-T170 COeura for 20080418_18Z Forecast from 20080415

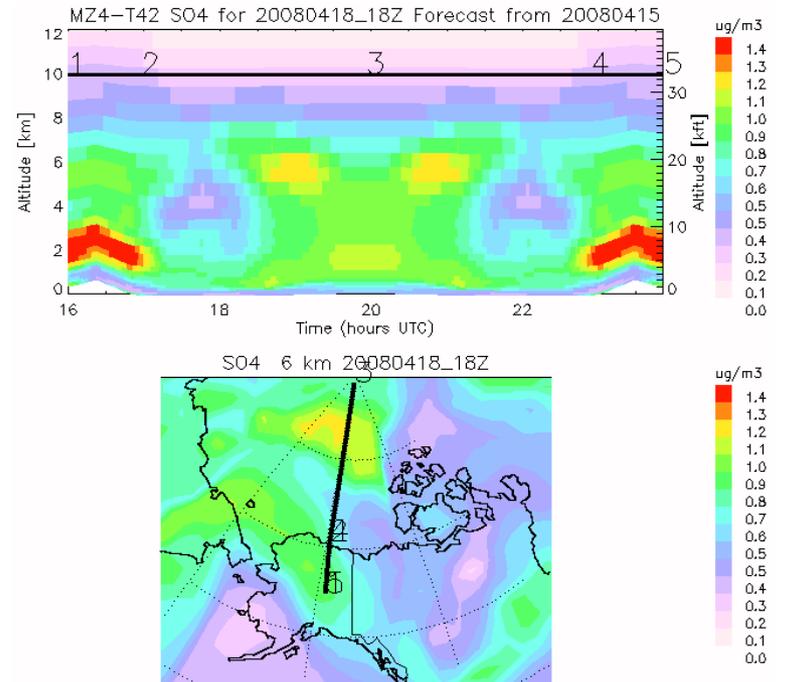


MZ4/GFS Apr 18 18Z

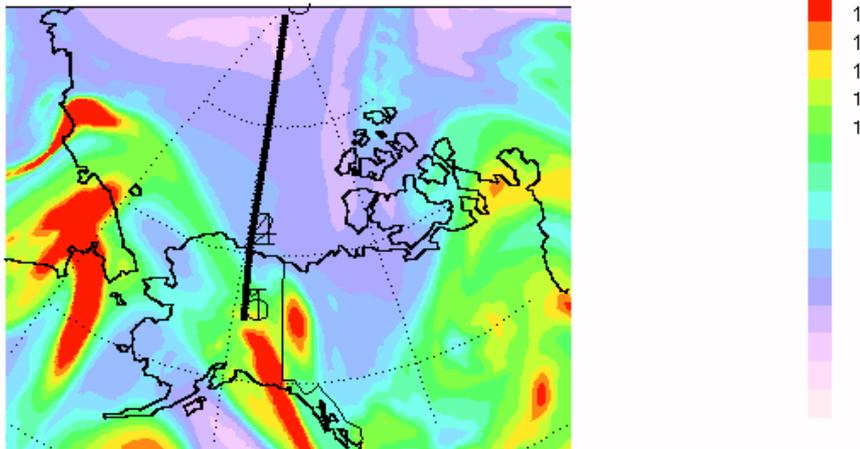
forecast from Apr 15
North Pole run



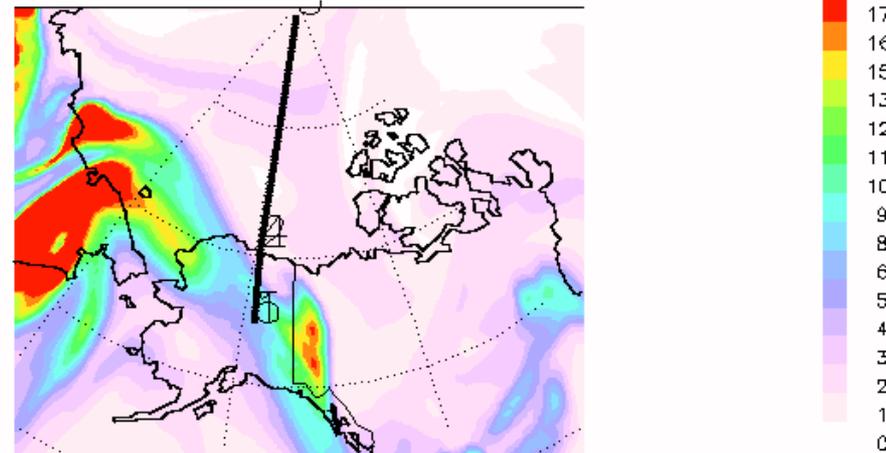
SO4



N.Asia Anthro 4 km



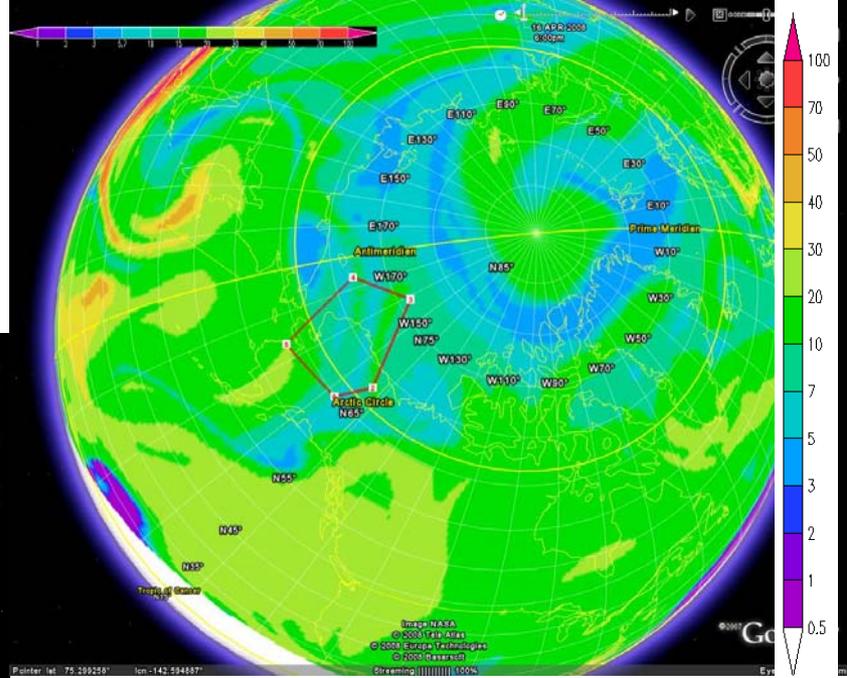
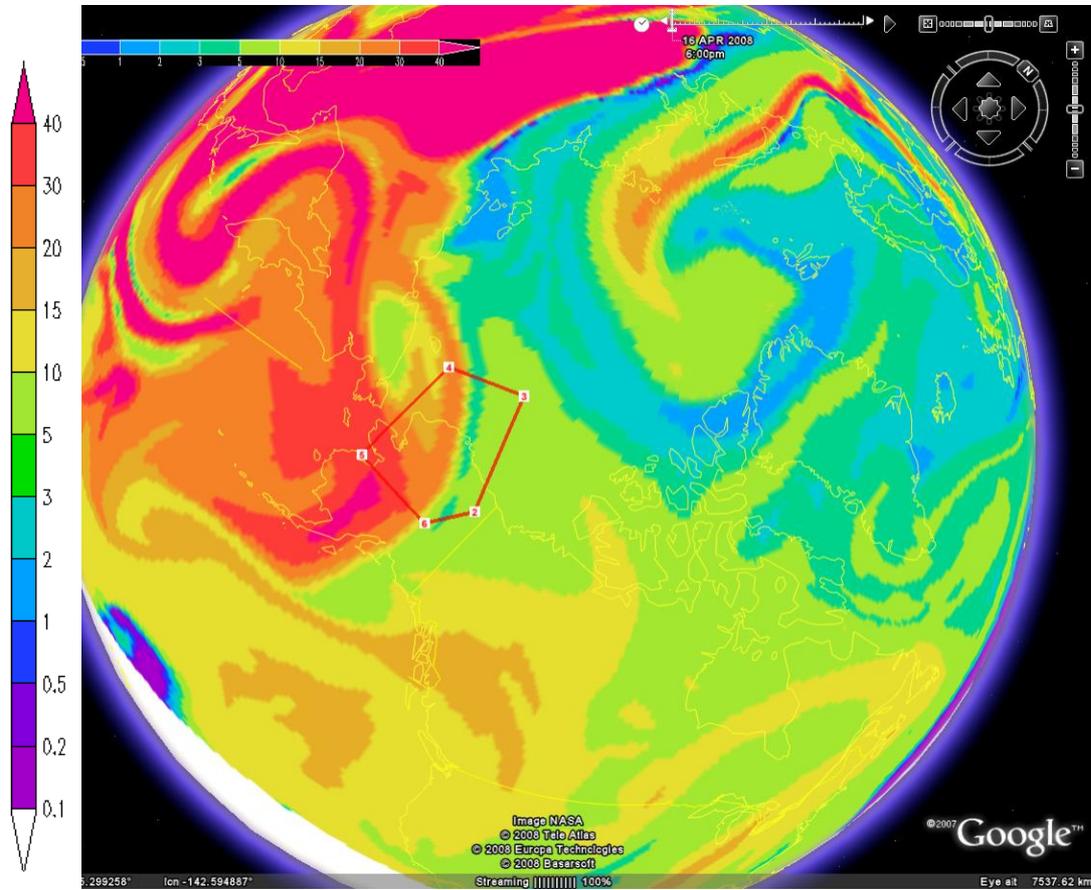
N.Asia Fires 4 km



Anthropogenic CO

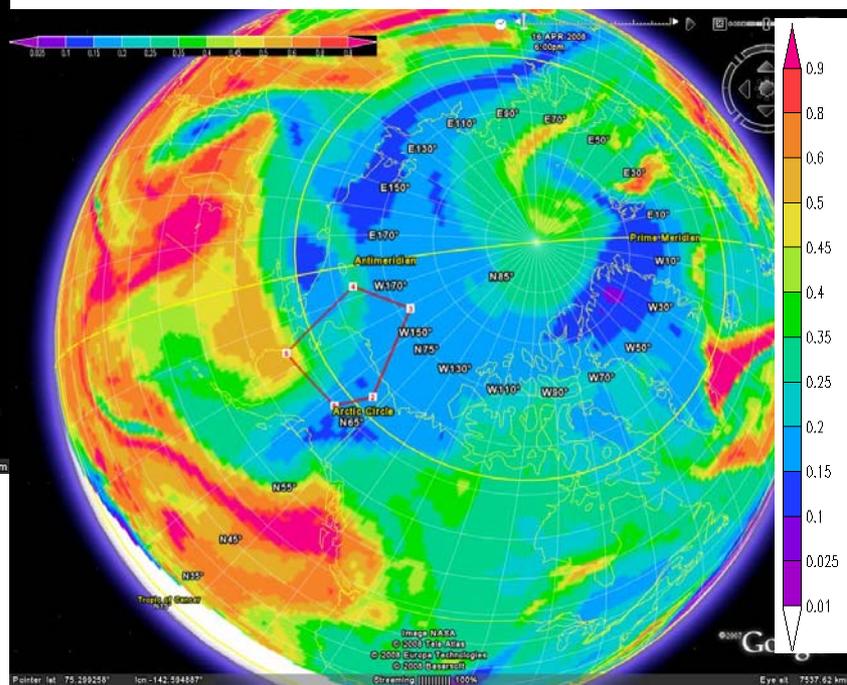
Pentagon Flight

April 16th, 18Z, 5.4 km (42hr)



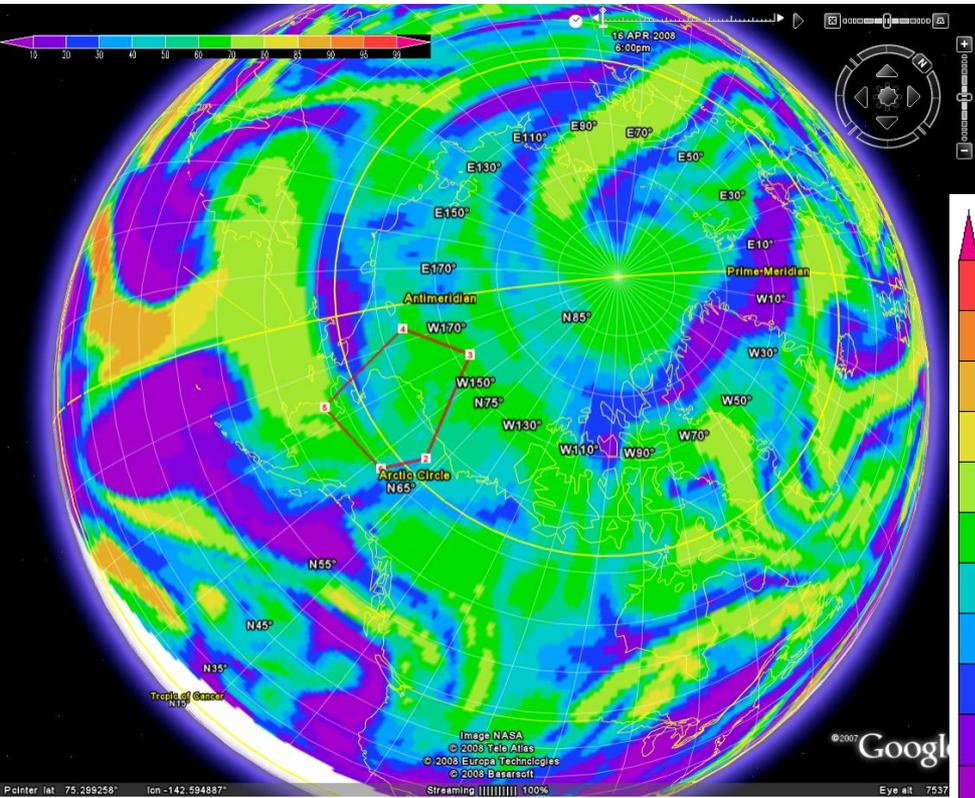
Biomass CO

AOD

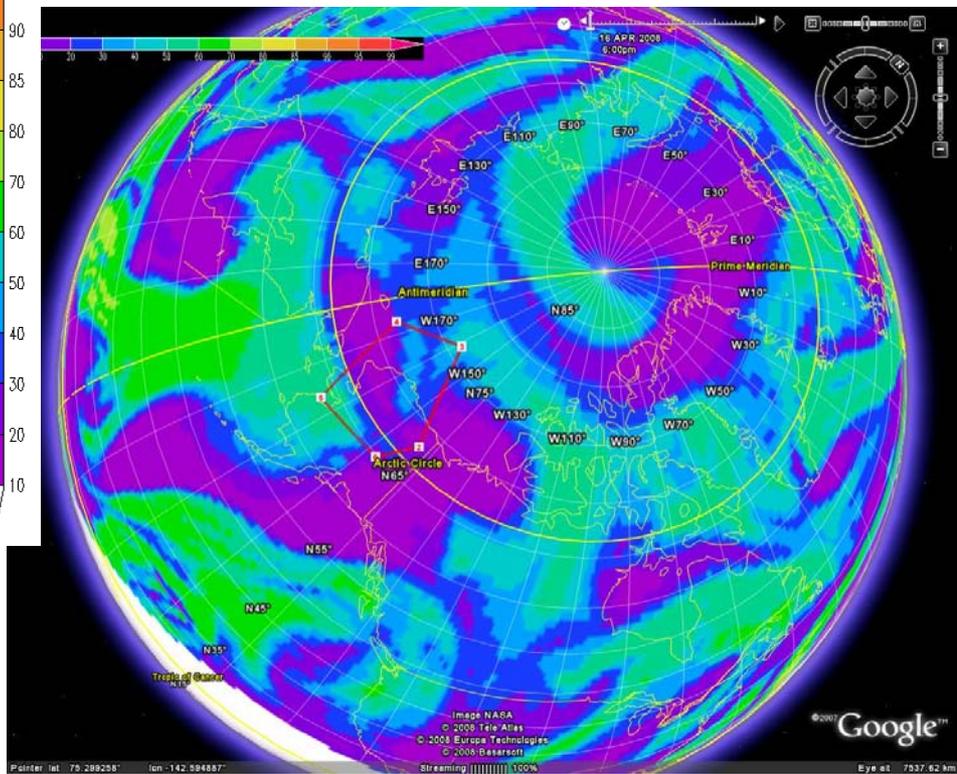


April 16th RH

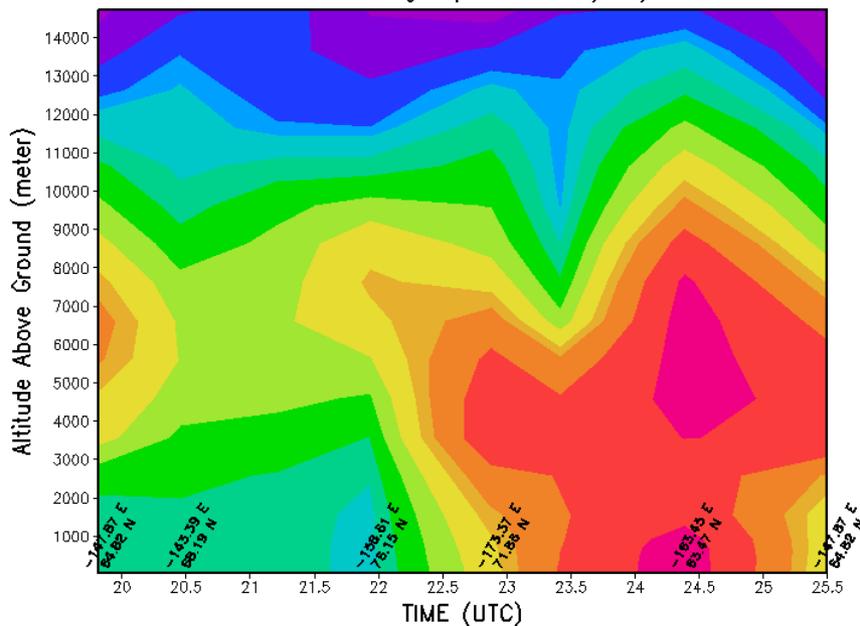
18z, 5.5 km



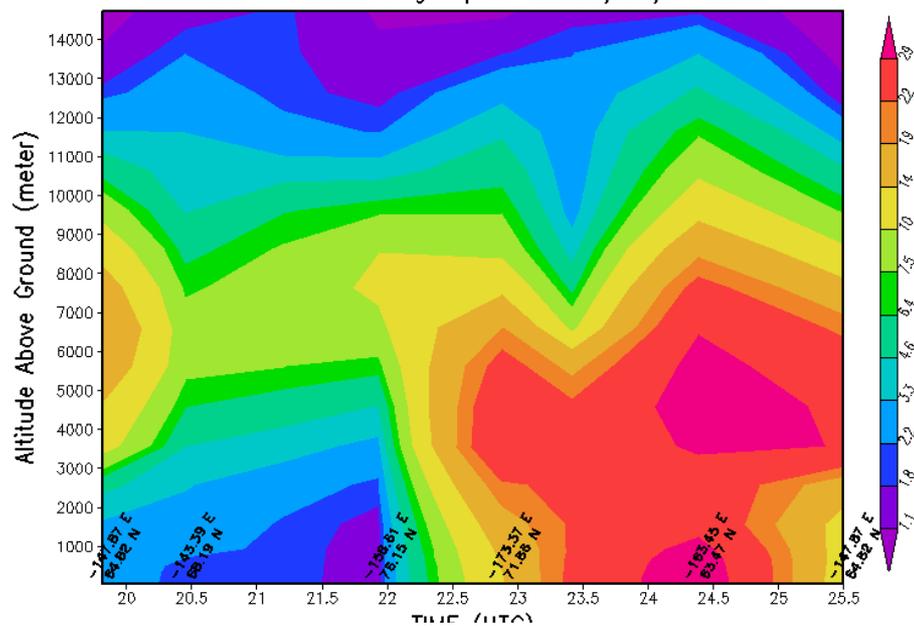
18z, 8.4 km



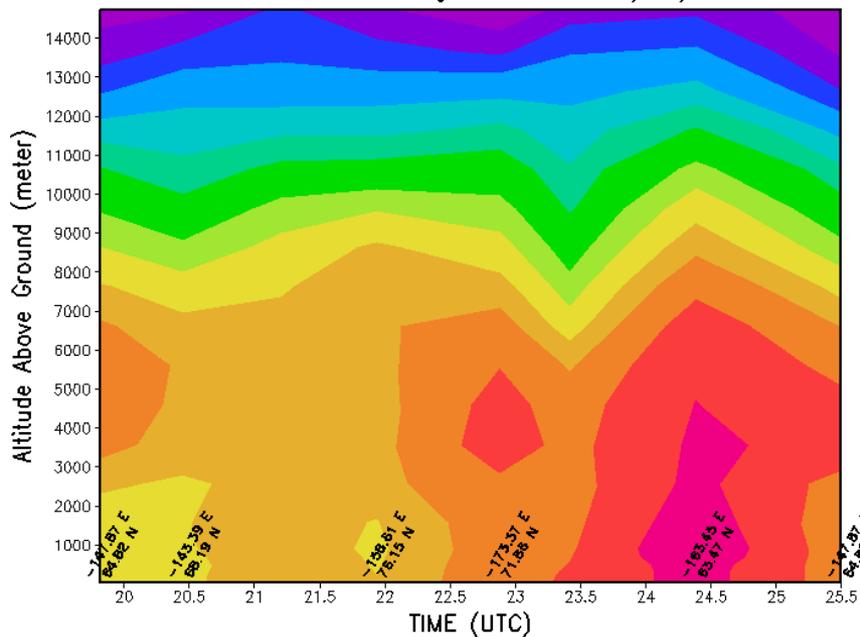
Simulated total CO (ppbv) along the DC8-FAI-FAI Flight plan on 04/16/2008



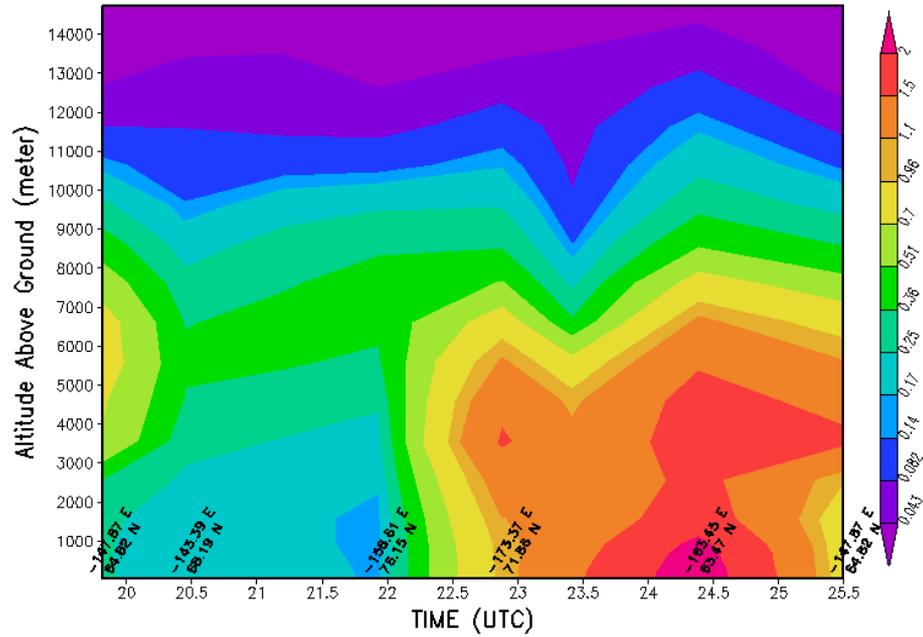
Simulated BiomassCO (ppbv) along the DC8-FAI-FAI Flight plan on 04/16/2008



Simulated Total Sulfate ($\mu\text{g}/\text{m}^3$) along the DC8-FAI-FAI Flight Path on 04/16/2008



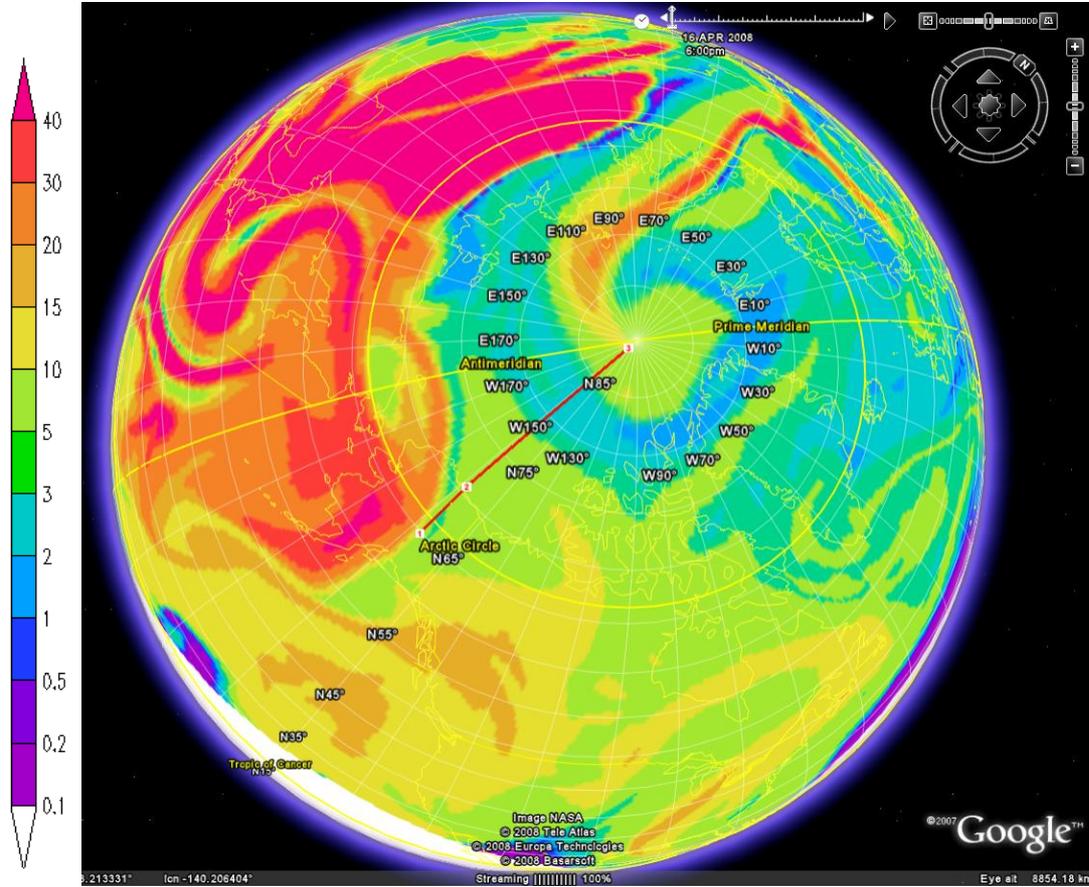
Simulated Organic Carbon ($\mu\text{g}/\text{m}^3$) along the DC8-FAI-FAI Flight Path on 04/16/2008



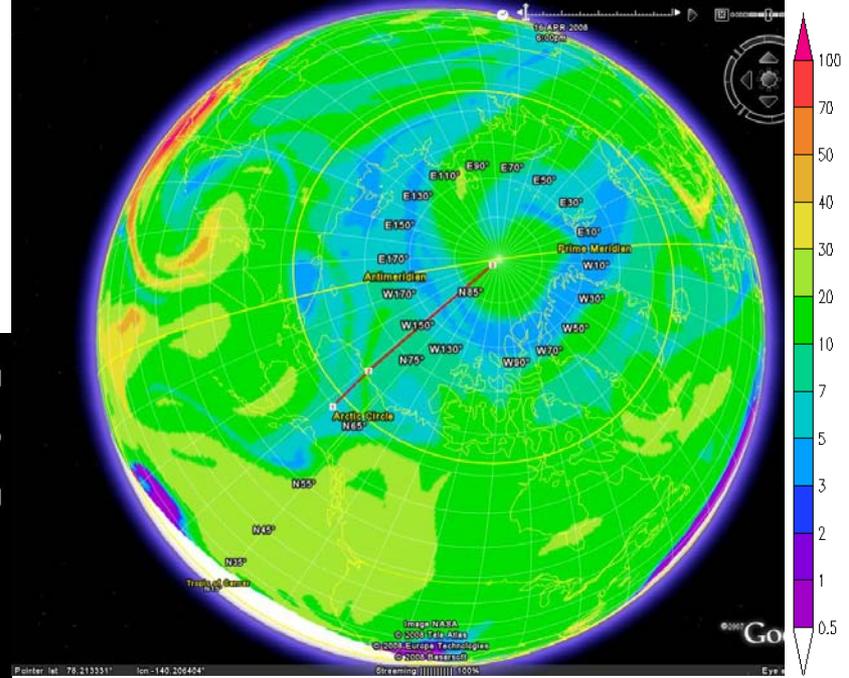
Anthropogenic CO

Europe Flight

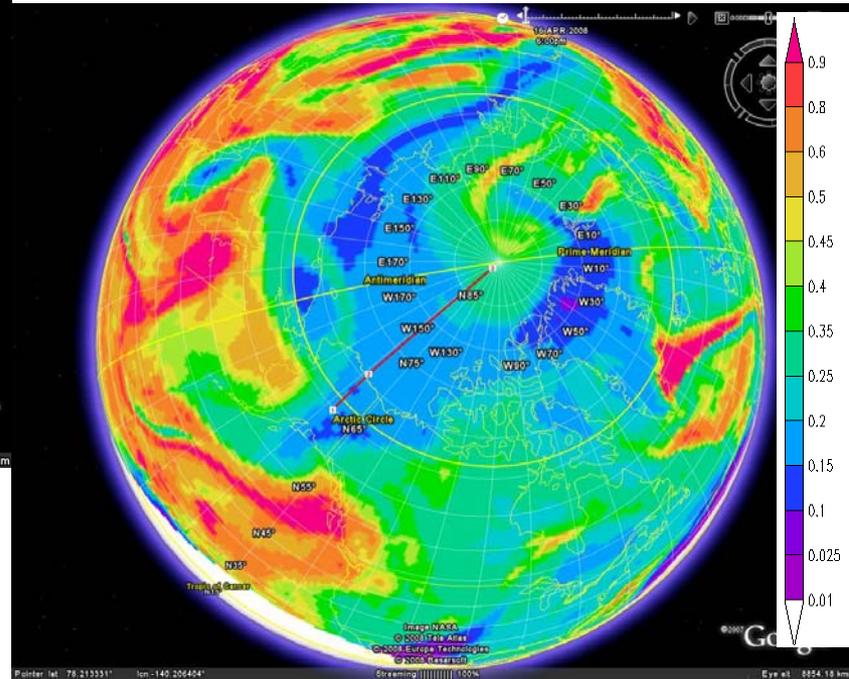
April 16th, 18Z, 5.4 km (42hr)



Biomass CO



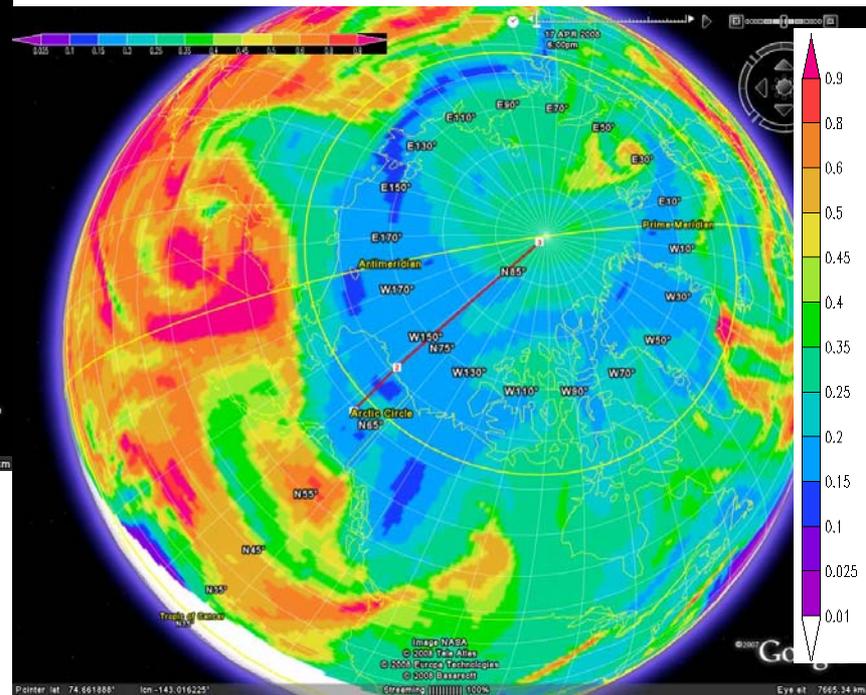
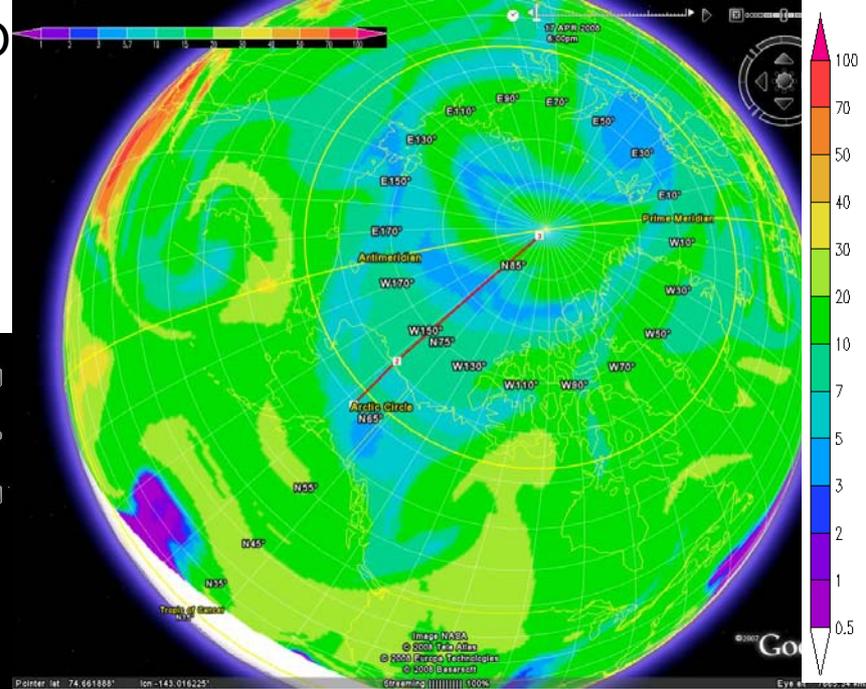
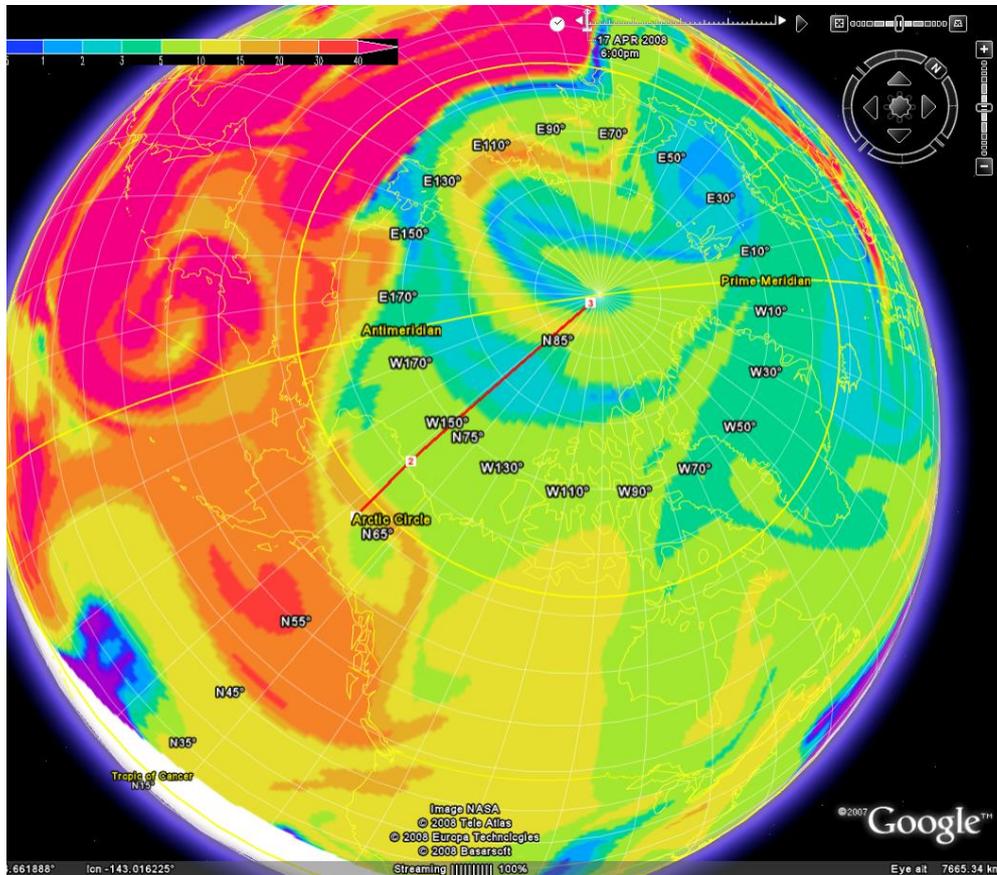
AOD



Anthropogenic CO

Europe Flight

April 17th, 18Z, 5.4 km (66hr)

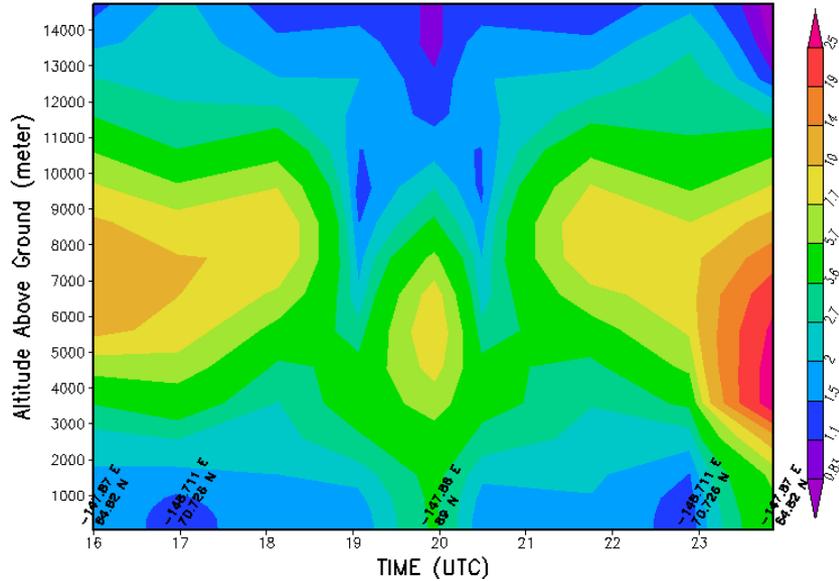


Biomass CO

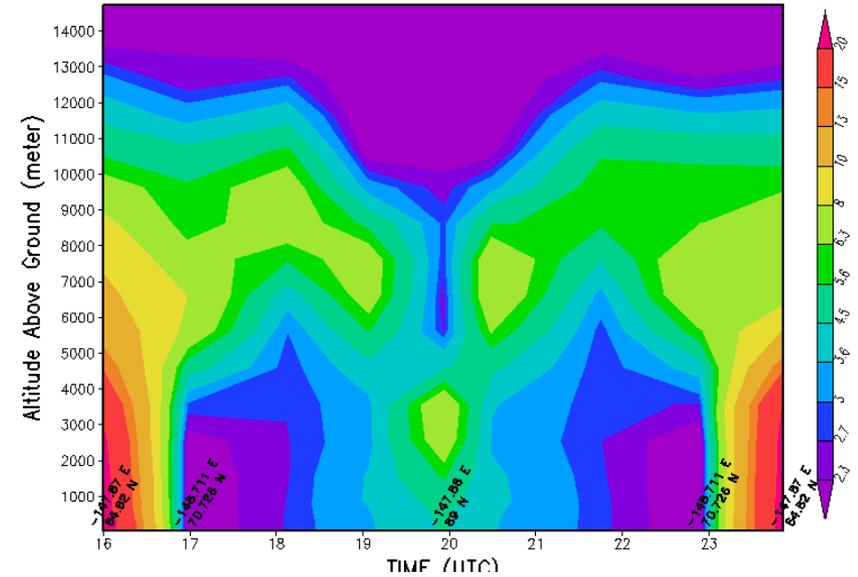
AOD

Pole-ward Flight 16-17 curtains: Scales Different

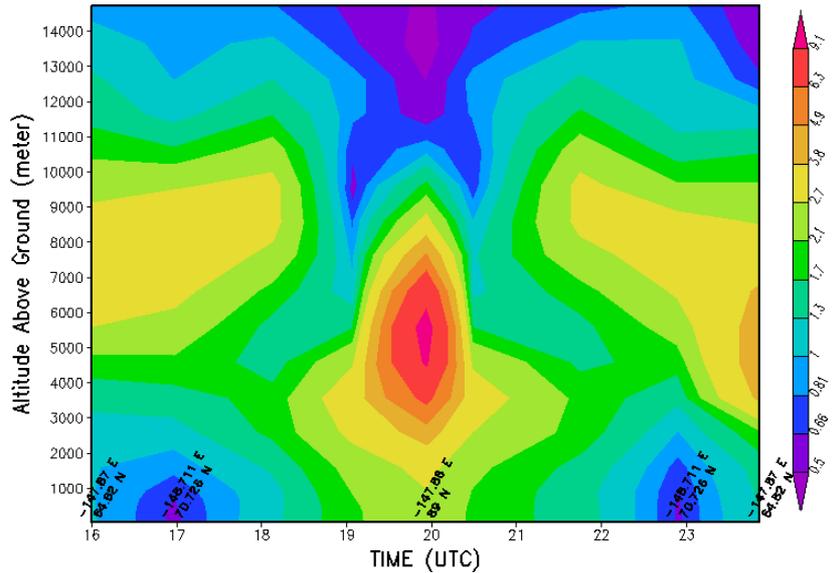
Simulated BiomassCO (ppbv) along the DC8-FAI-NP Flight plan on 04/16/2008



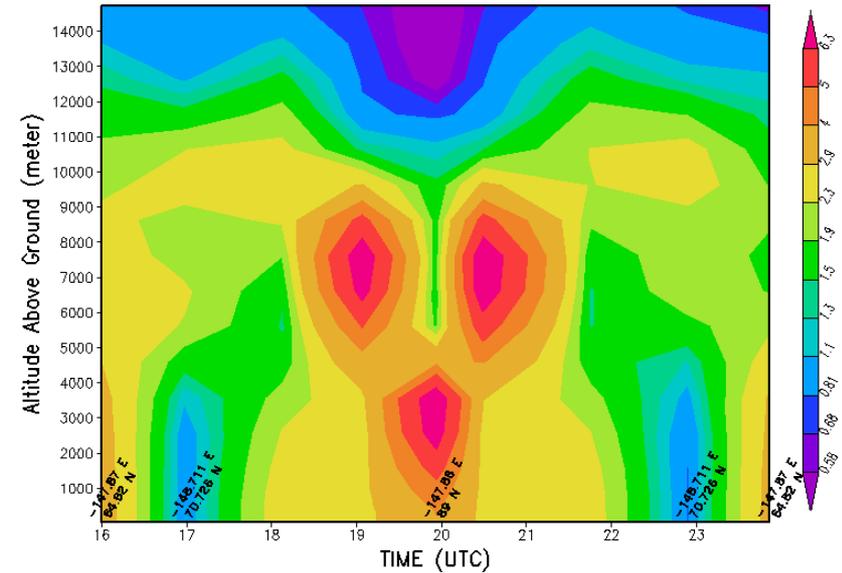
Simulated BiomassCO (ppbv) along the DC8-FAI-NP Flight plan on 04/17/2008



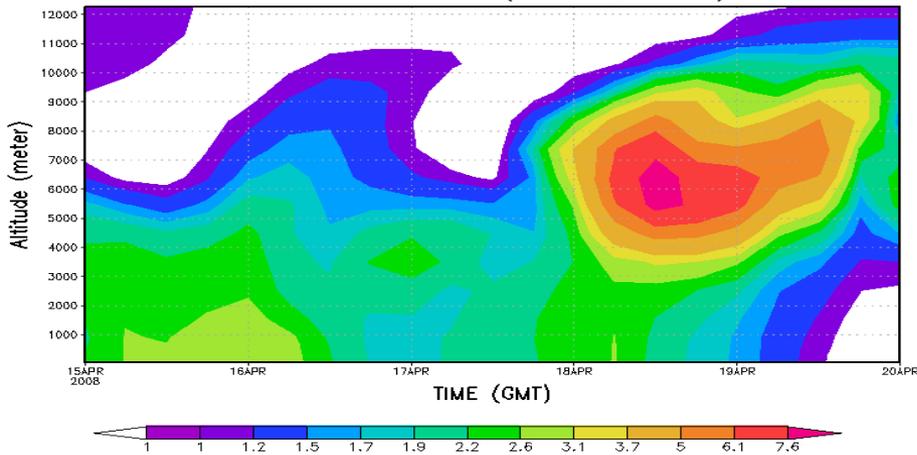
Simulated Europe CO (ppbv) along the DC8-FAI-NP Flight Path on 04/16/2008



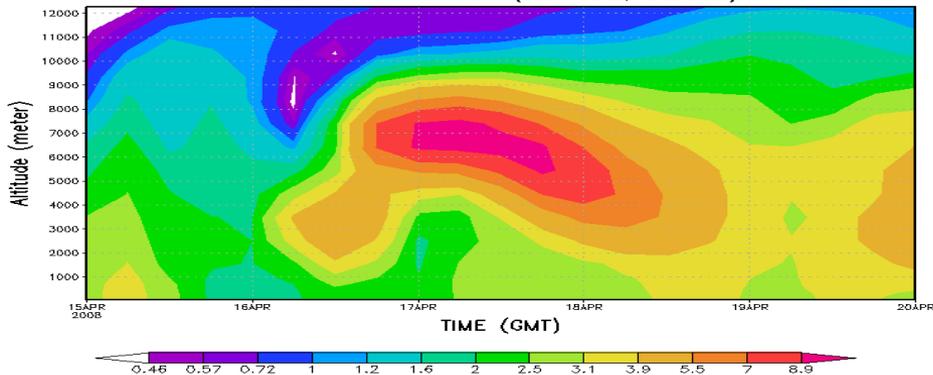
Simulated Europe CO (ppbv) along the DC8-FAI-NP Flight Path on 04/17/2008



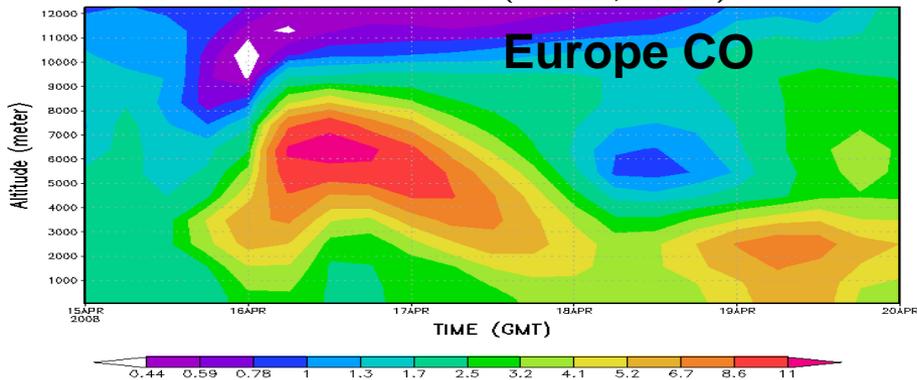
Simulated Time Series Europe_CO (ppbv) over X=105 Y=118 (149.63W, 82.46N)



Simulated Time Series Europe_CO (ppbv) over X=110 Y=117 (150.59W, 85.11N)

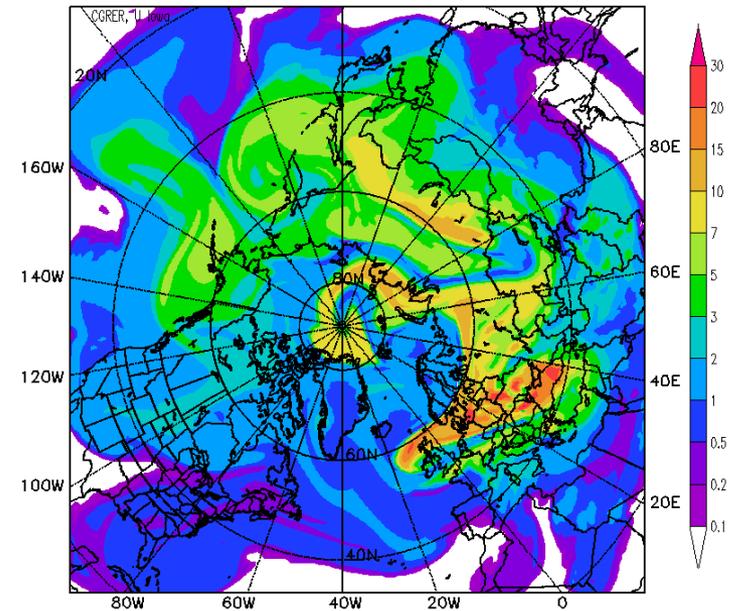


Simulated Time Series Europe_CO (ppbv) over X=115 Y=115 (148.92W, 87.84N)

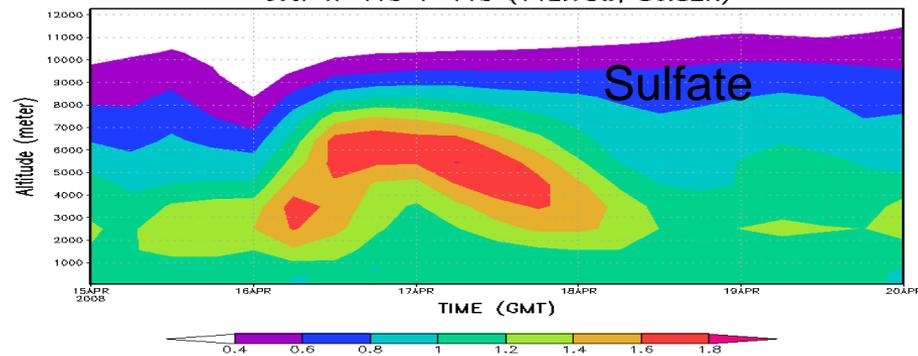


April 16 & 17 Good for Poleward Flight

Simulated Europe_CO (ppbv) in the 5.5km layer at 12UTC, 04/17/2008



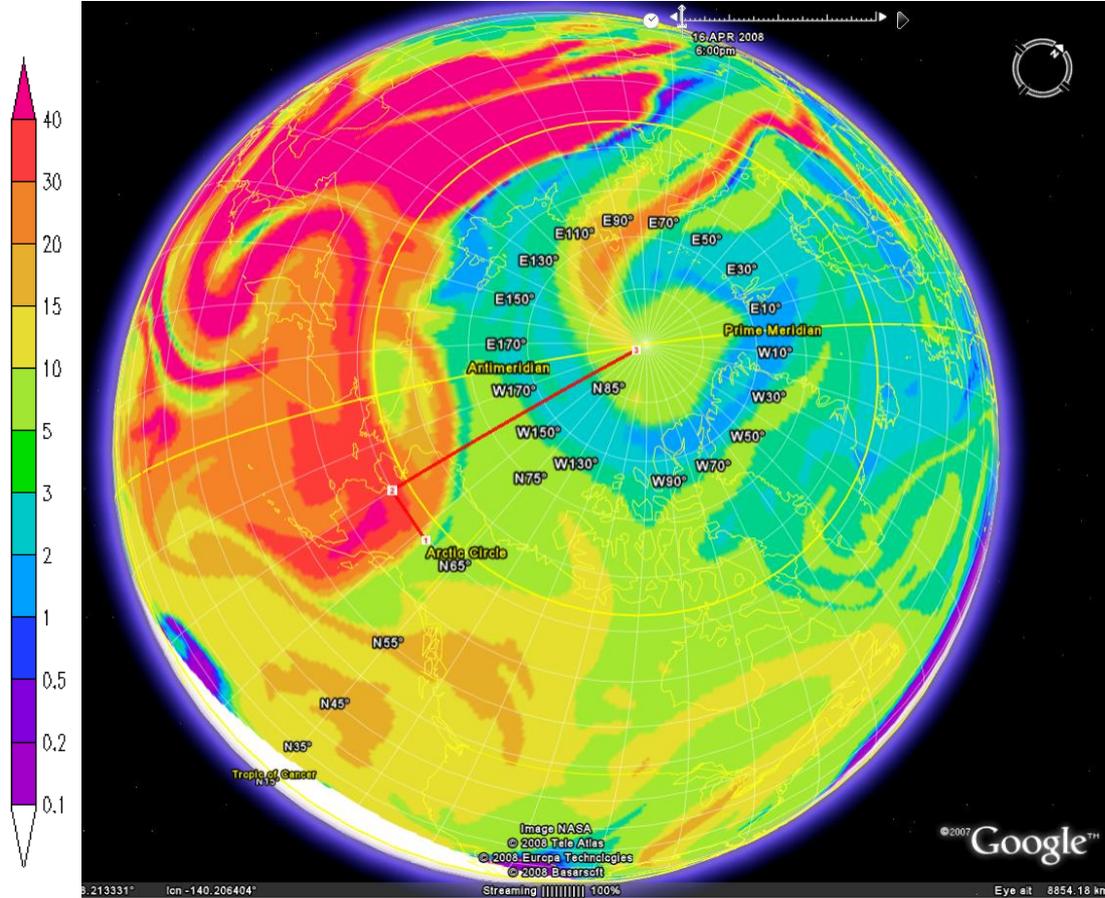
Simulated Time Series Sulfate (µg/std. m³) over X=113 Y=115 (142.73W, 86.82N)



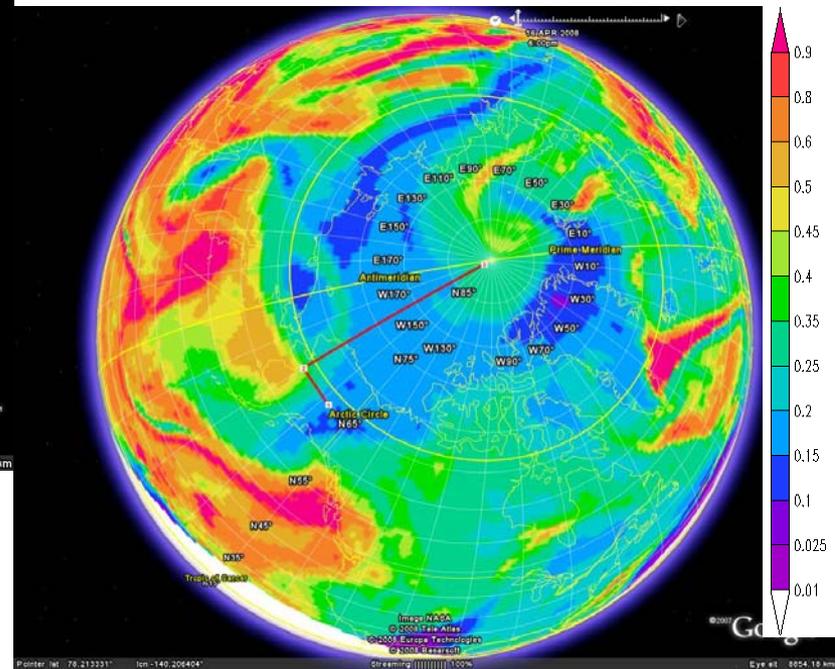
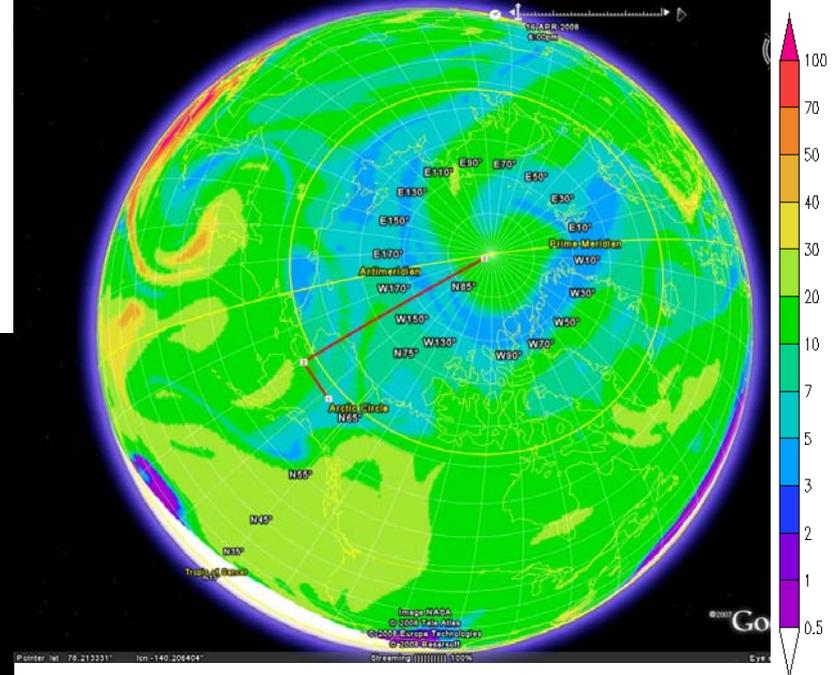
Anthropogenic CO

Asian/Europe Flight

April 16th, 18Z, 5.4 km (42hr)



Biomass CO

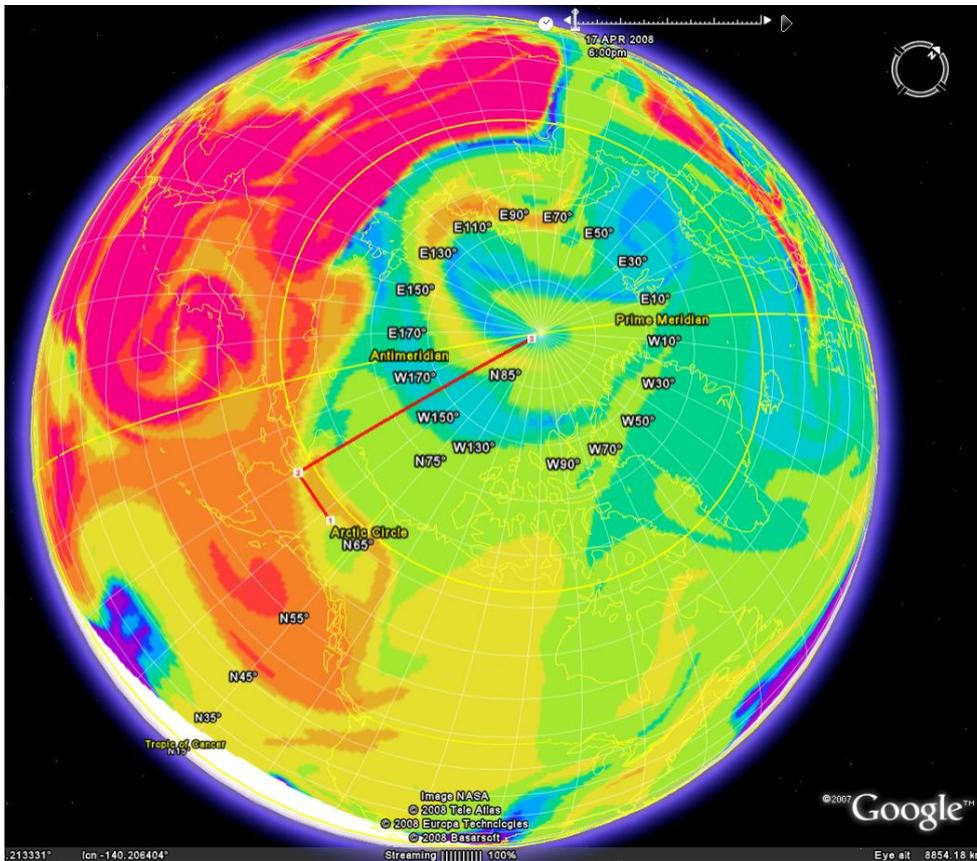


AOD

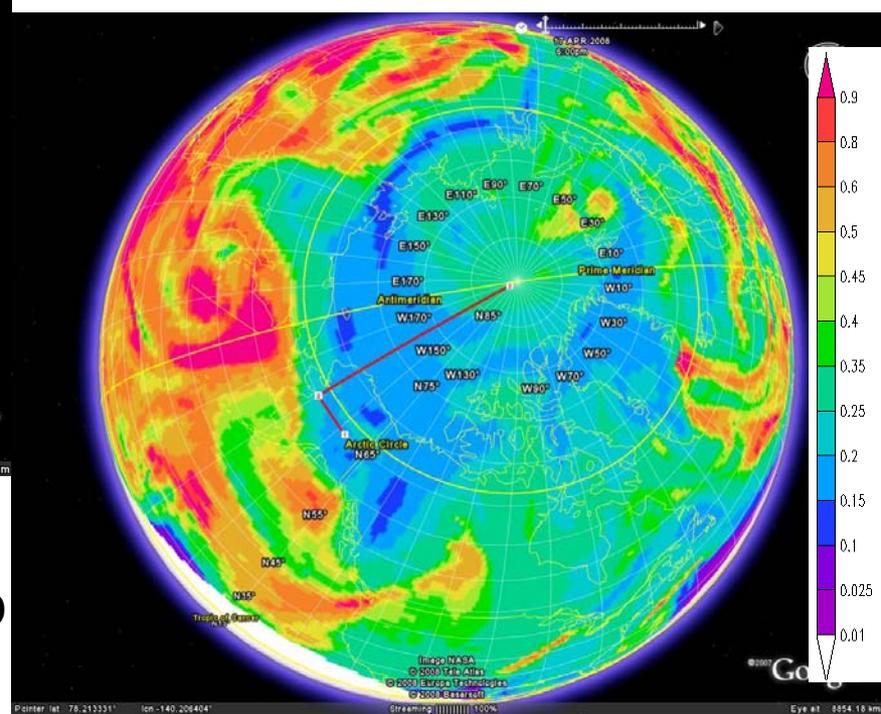
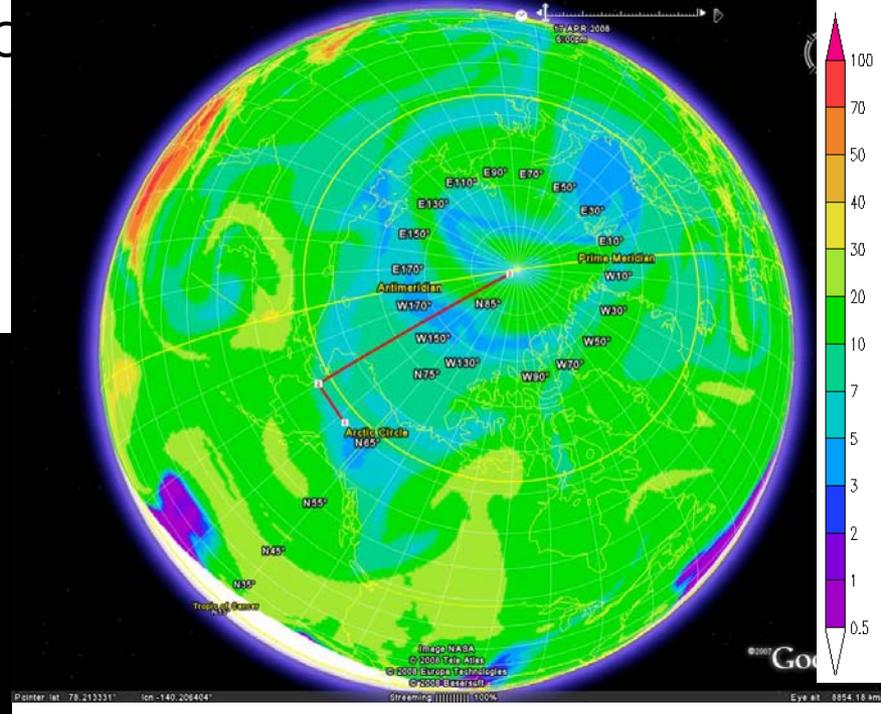
Anthropogenic CO₂

Asian/Europe Flight

April 17th, 18Z, 5.4 km (66hr)



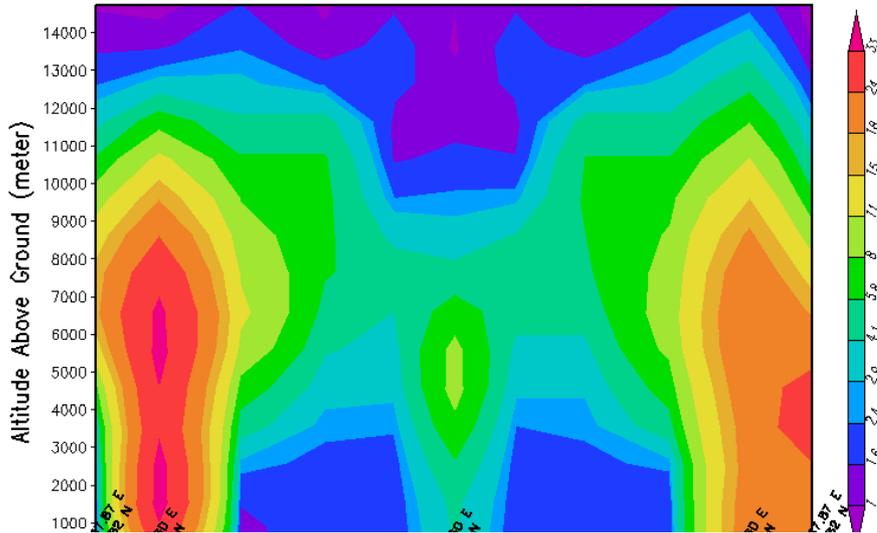
Biomass CO₂



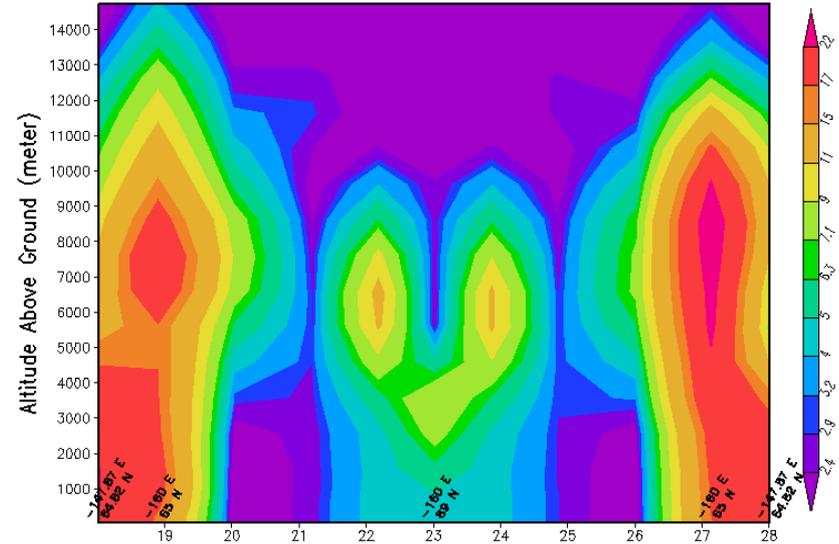
AOD

Curtains Combined Asia-Europe Scales Different

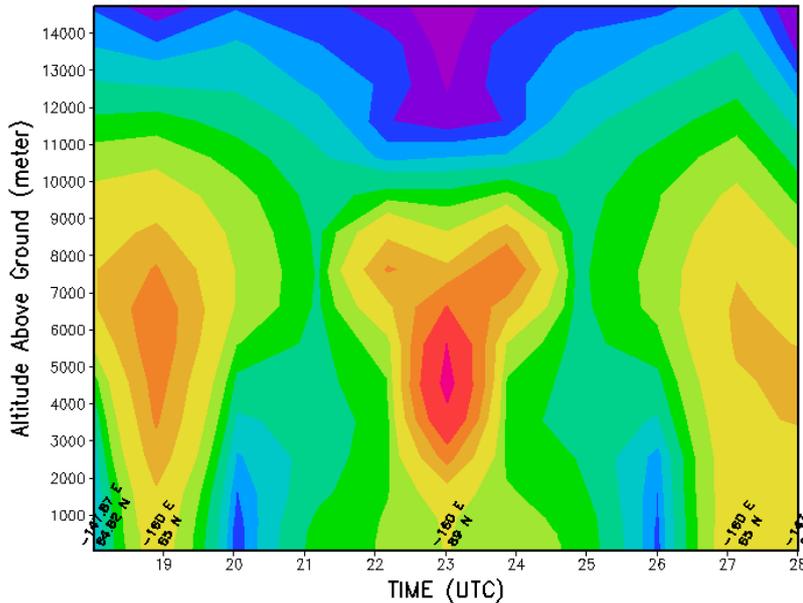
Simulated BiomassCO (ppbv) along the DC8-FAI-Asia-NP Flight plan on 04/16/2008



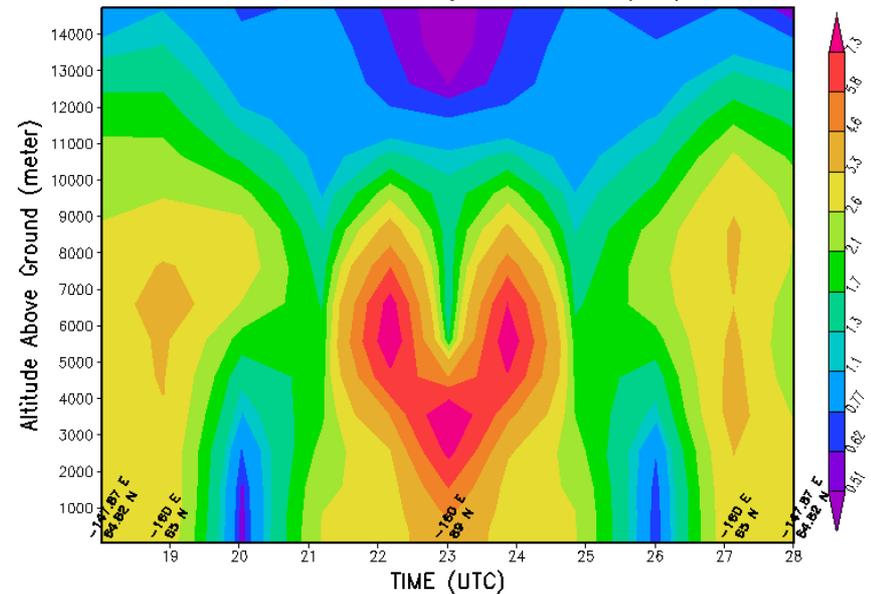
Simulated BiomassCO (ppbv) along the DC8-FAI-Asia-NP Flight plan on 04/17/2008



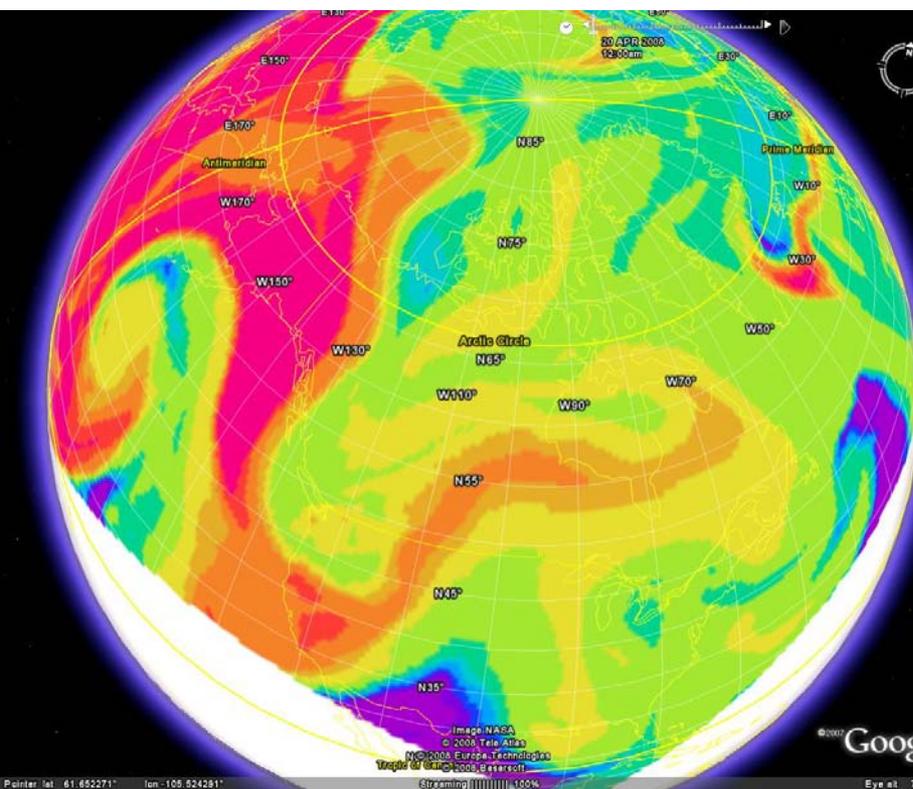
Simulated Europe CO (ppbv) along the DC8-FAI-Asia-NP Flight Path on 04/16/2008



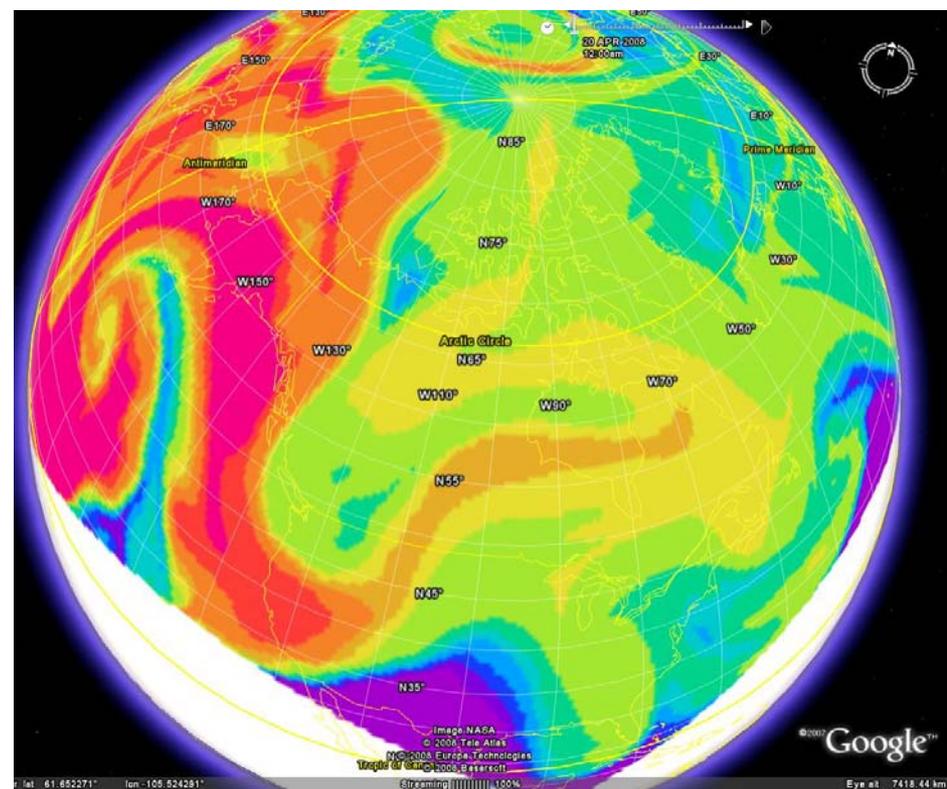
Simulated Europe CO (ppbv) along the DC8-FAI-Asia-NP Flight Path on 04/17/2008



Transit 19th ?? (12 hr)

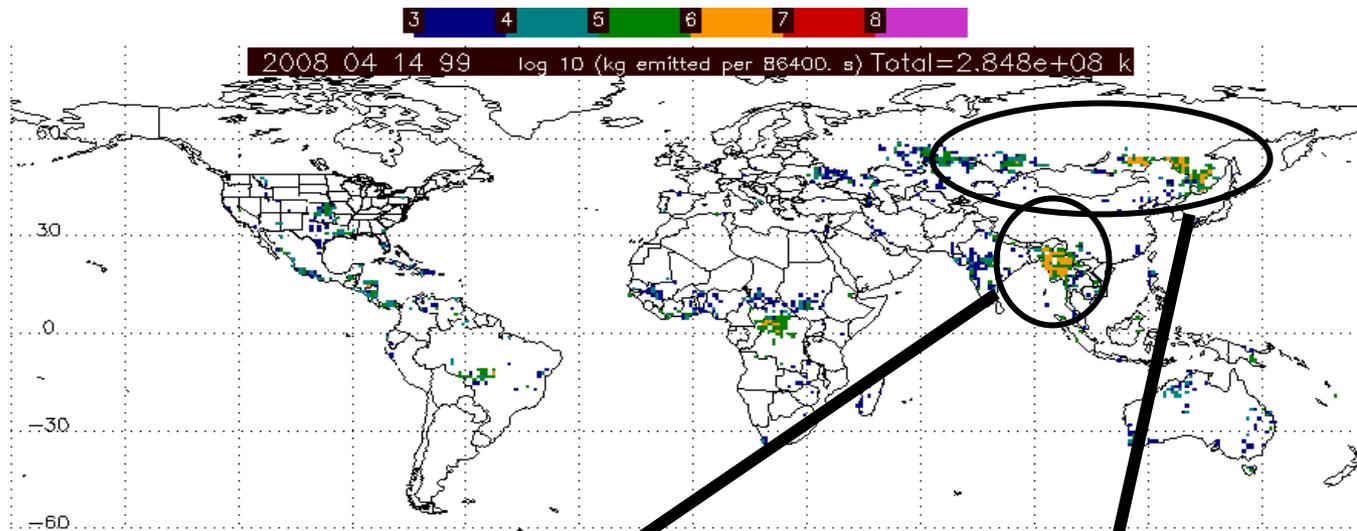


Biomass 5.5 km, 0Z, 20th

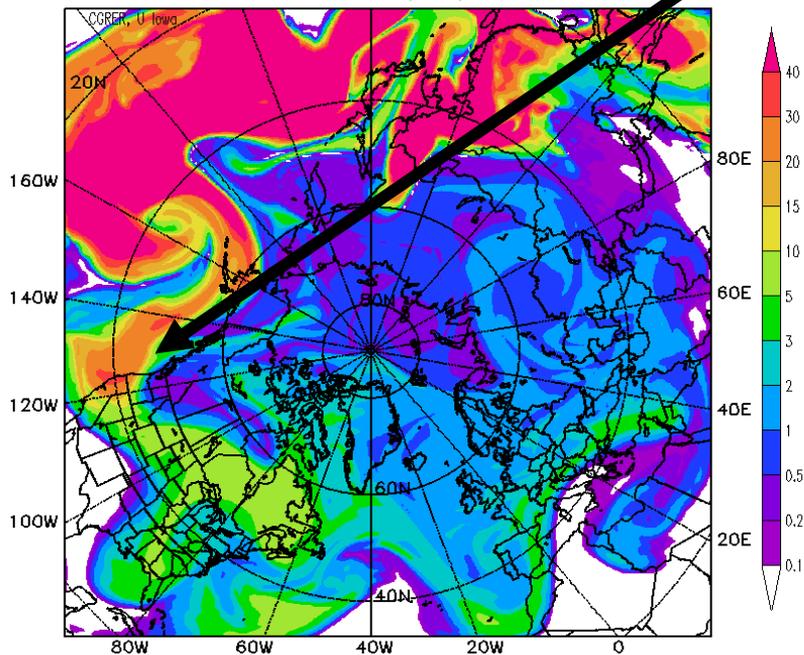


Biomass 8.4 km, 0Z, 20th

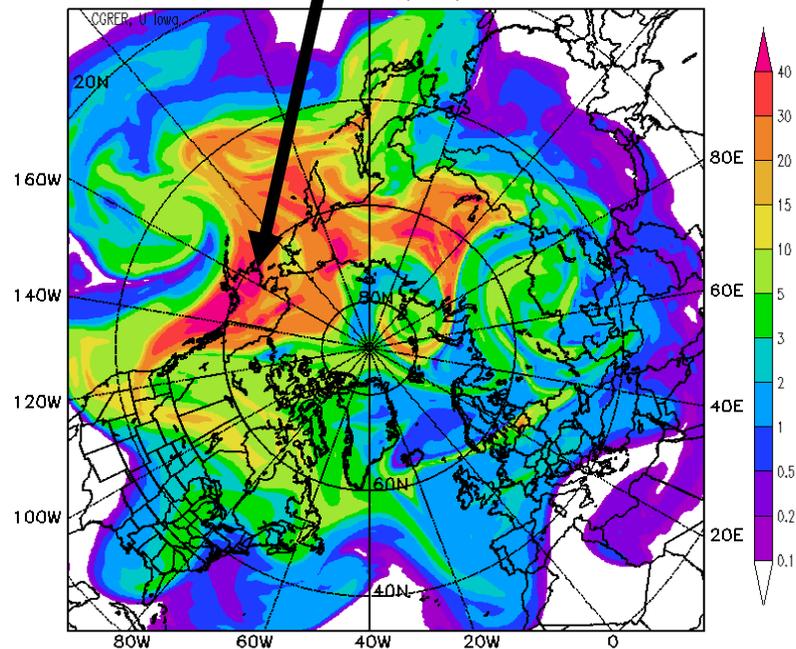
April 19 18Z: Asian Inflow into N. America



Simulated SAsia_BB_CO (ppbv) in the 8.4km layer at 18UTC, 04/19/2008

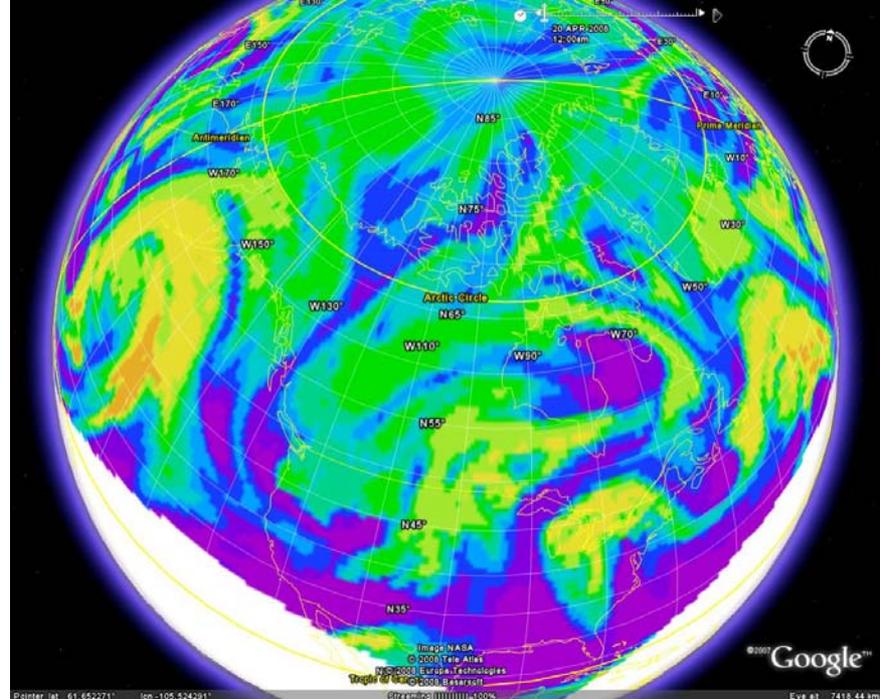
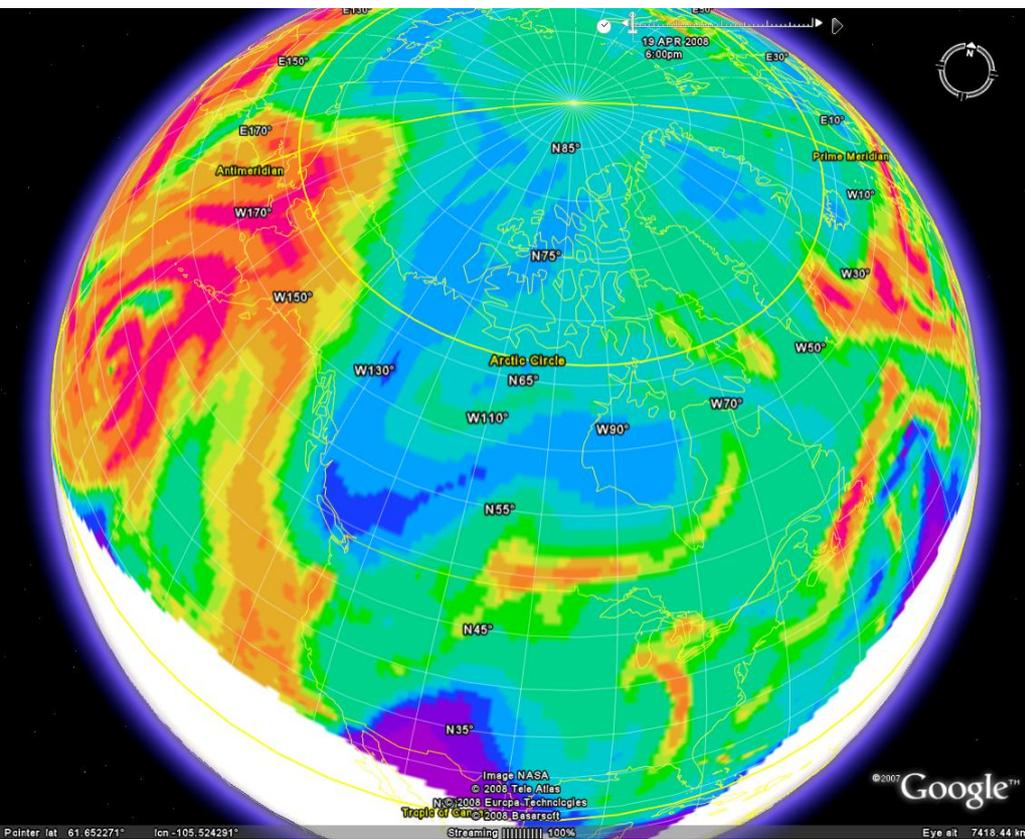


Simulated NAsia_BB_CO (ppbv) in the 8.4km layer at 18UTC, 04/19/2008



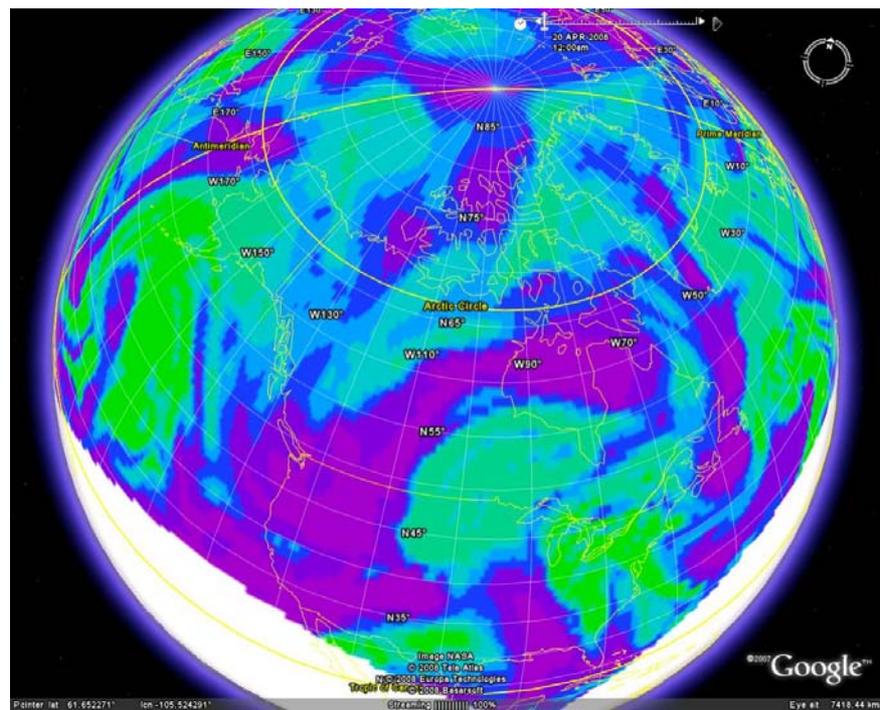
RH 120 hr 5.5km layer

Transit Home



AOD 114 hr

RH-120 hr 8.5 km layer

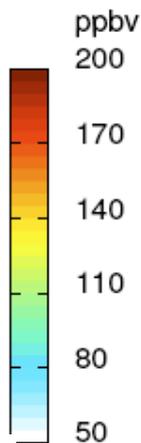
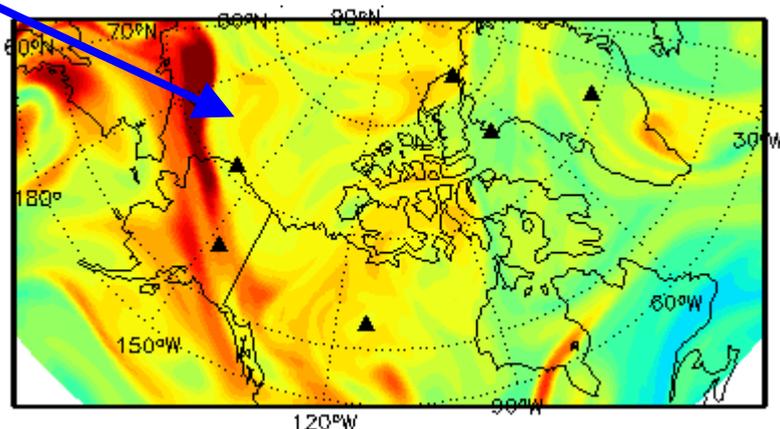
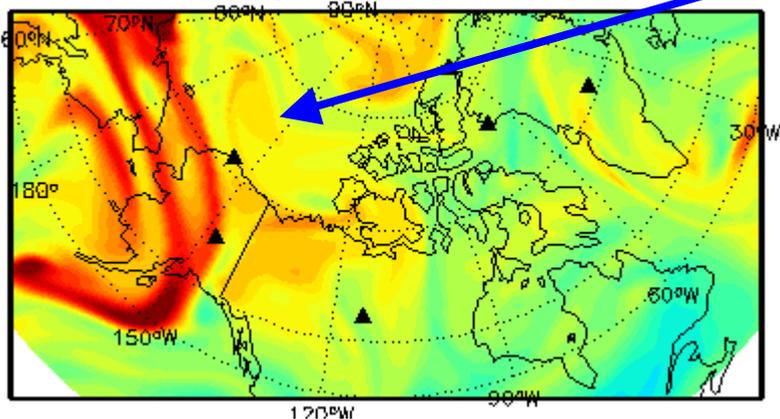


Total CO 500 hPa

Older Asian Plume

4/16

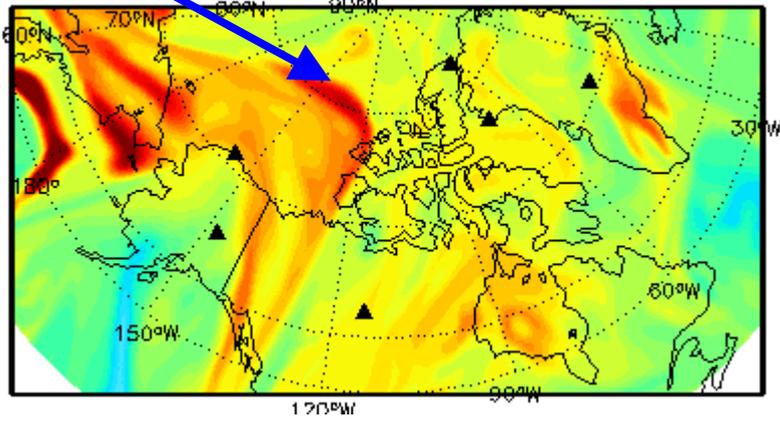
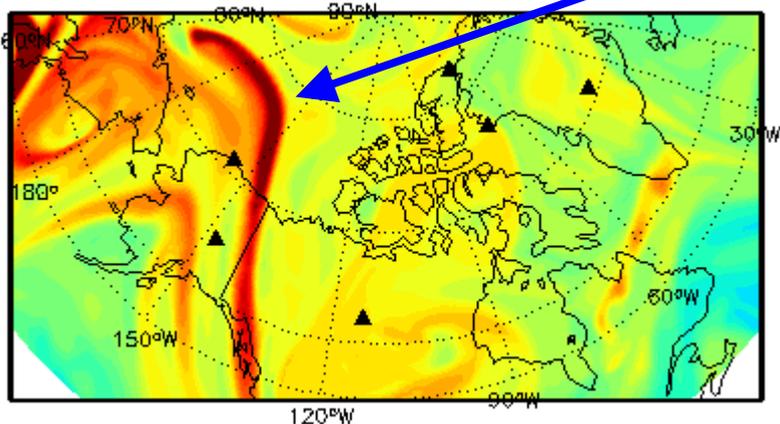
4/17



4/18

Penetration into Arctic

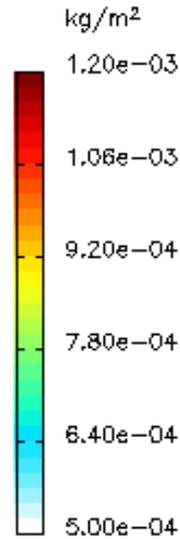
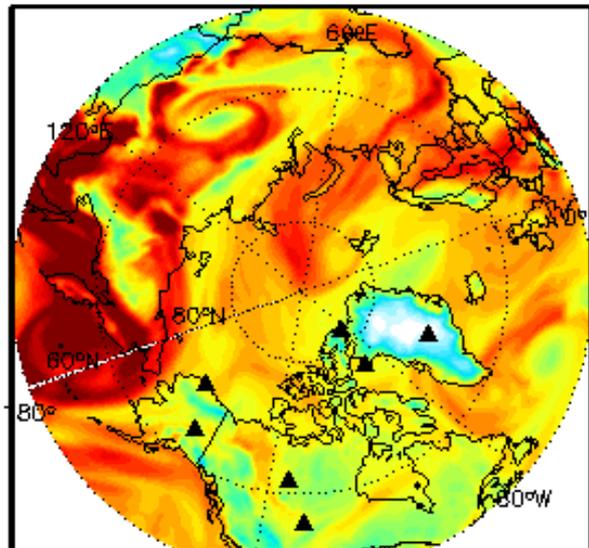
4/19



Using 4/15 6z forecast

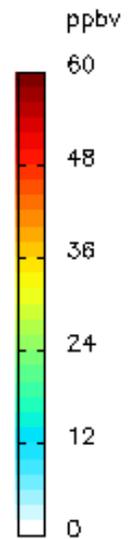
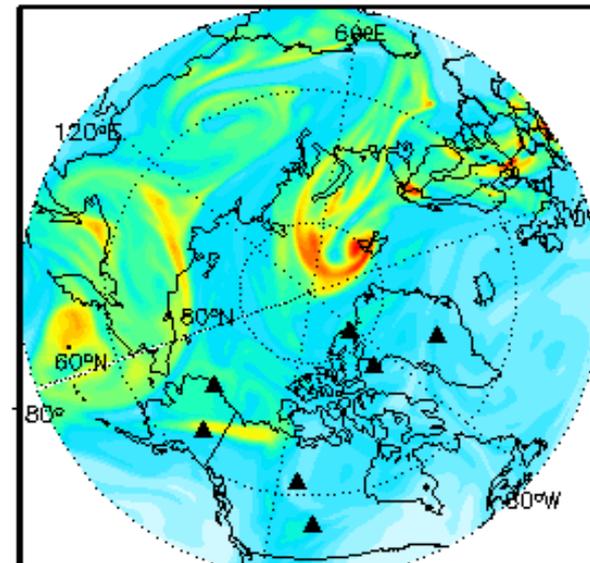
Total CO Column

20080415 19:30Z



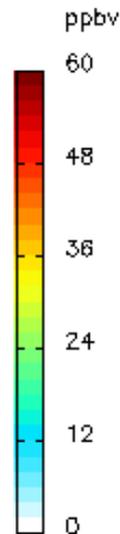
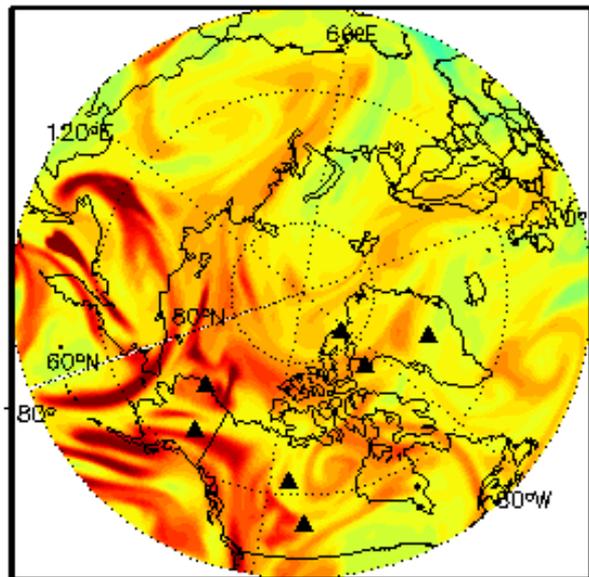
European Anthro. CO (ppbv) 500 mb

500 hPa (5.6 km) 20080415 19:30Z



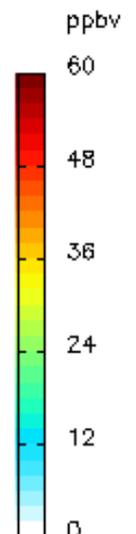
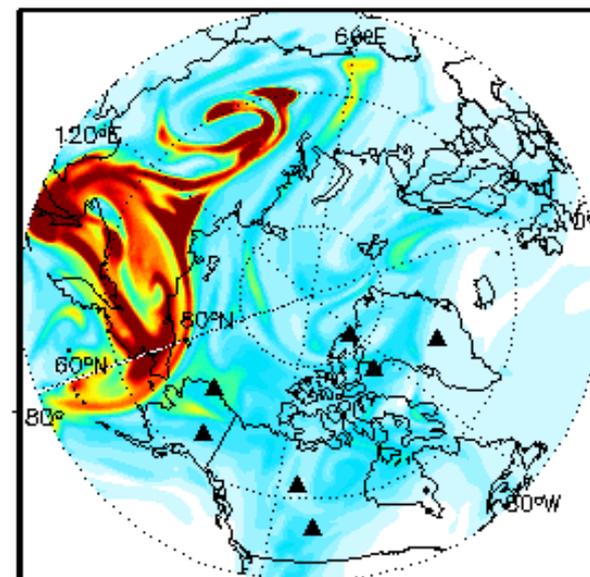
Asian Anthro. CO (ppbv) 500 mb

500 hPa (5.6 km) 20080415 19:30Z



Boreal Burning CO (ppbv) 500 mb

500 hPa (5.6 km) 20080415 19:30Z



DC-8 : FAI to North Pole

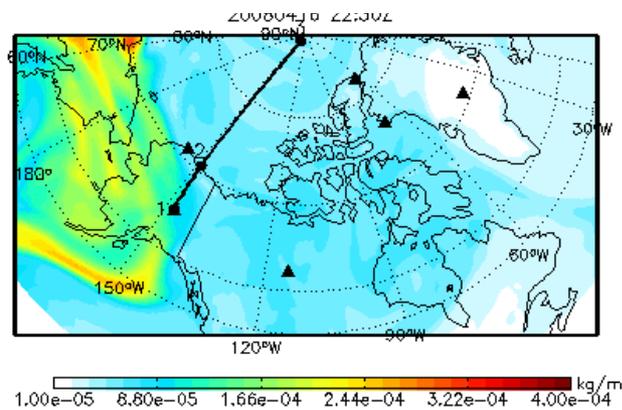
April 16th – 17th

All plots hereafter are for 22:30 UTC.

(Previous plots were 19:30 UTC.)

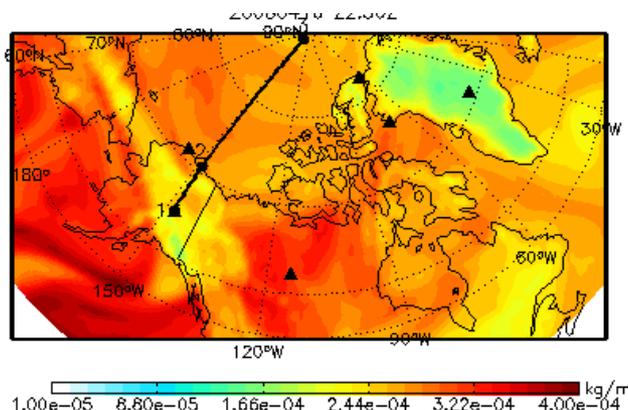
Boreal CO Column

16th



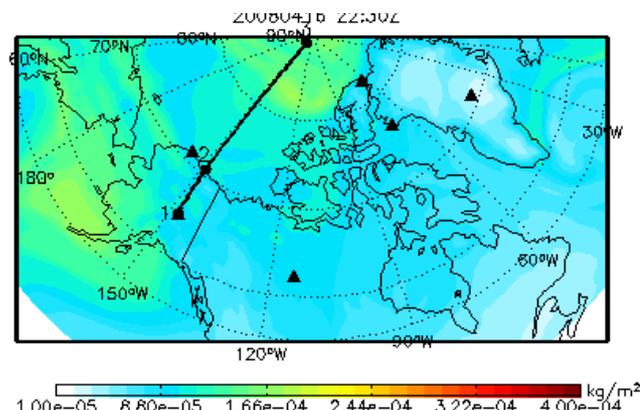
Asian Anthro. CO Column

16th

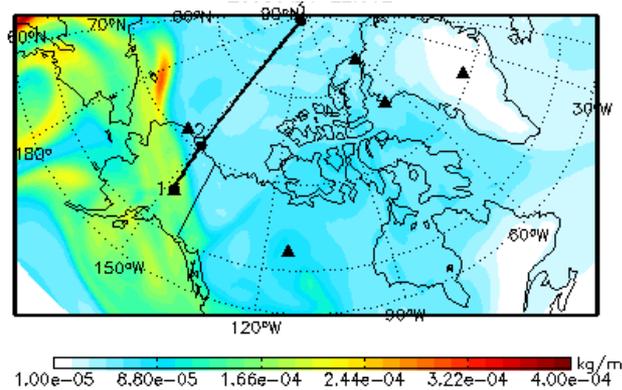


Euro. Anthro. CO Column

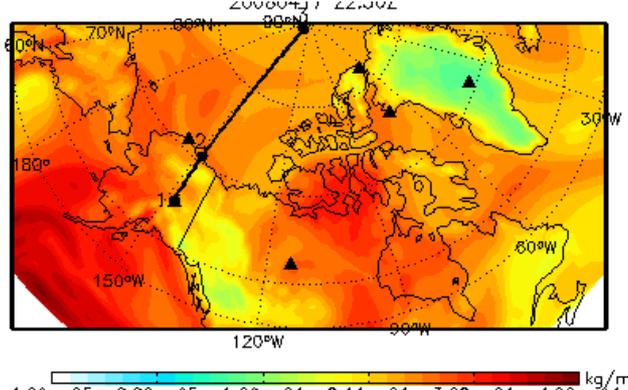
16th



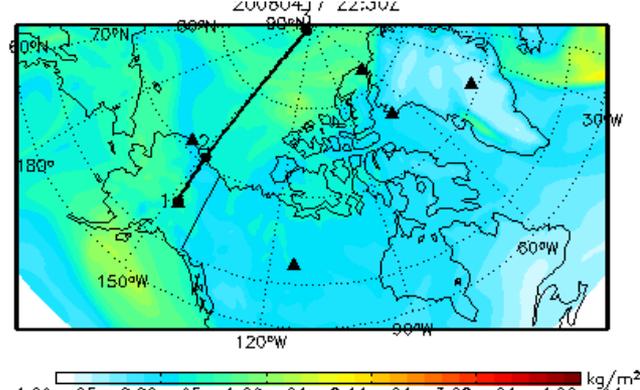
17th



17th



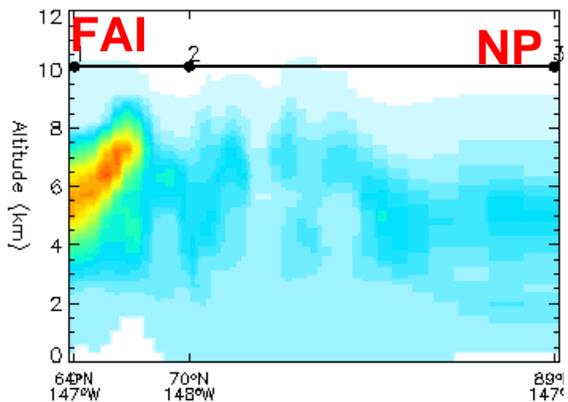
17th



Well Mixed: N. American Anthro. Nonboreal Biomass Burning

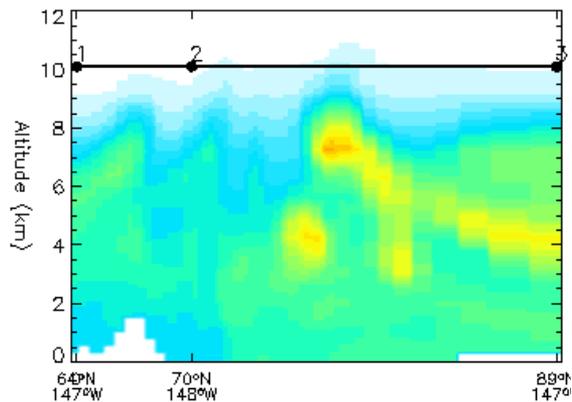
Boreal CO

16th



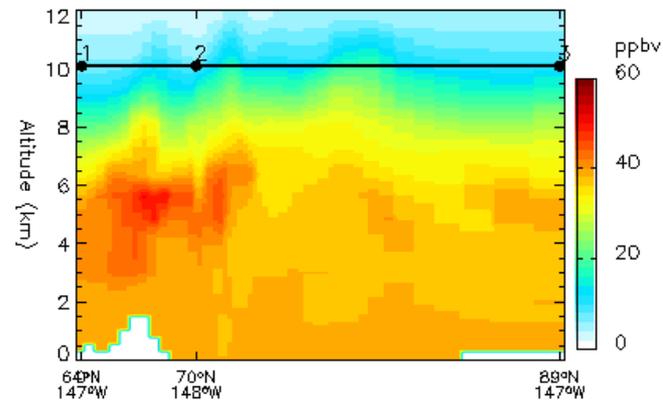
Euro. Anthro. CO

16th

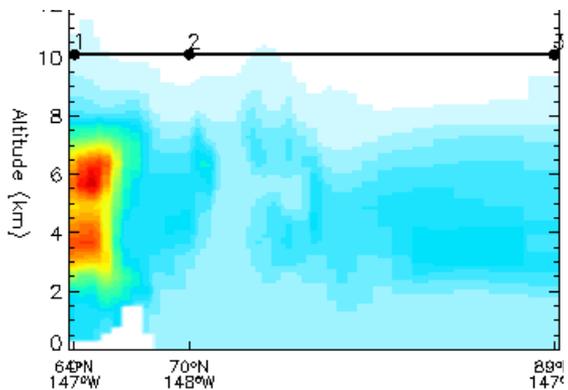


Asian Anthro. CO

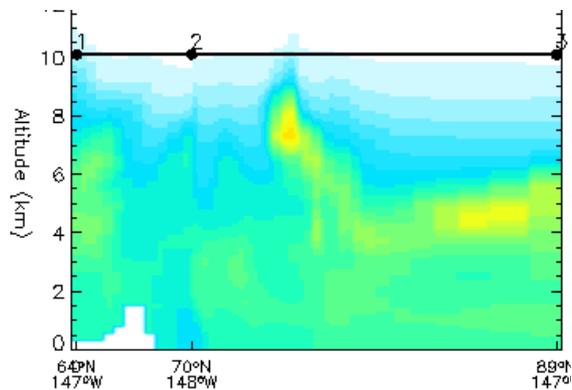
16th



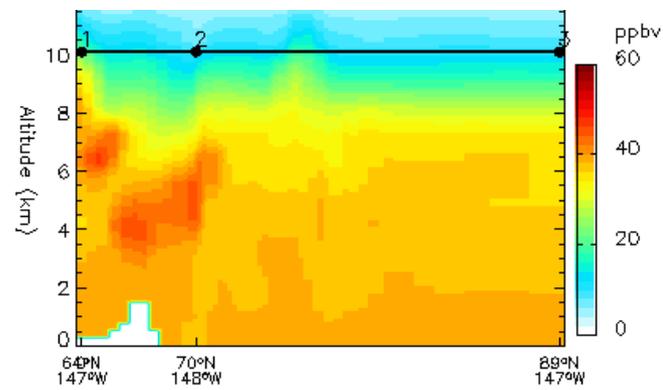
17th



17th

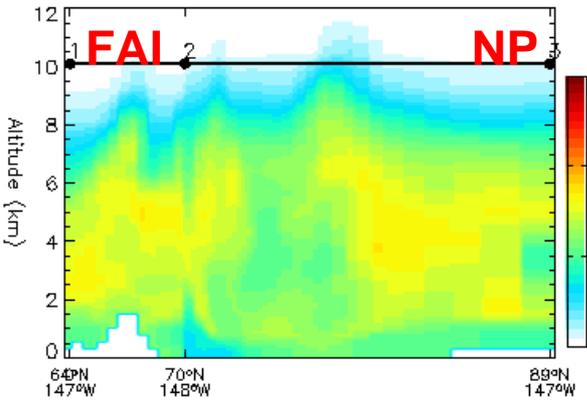


17th



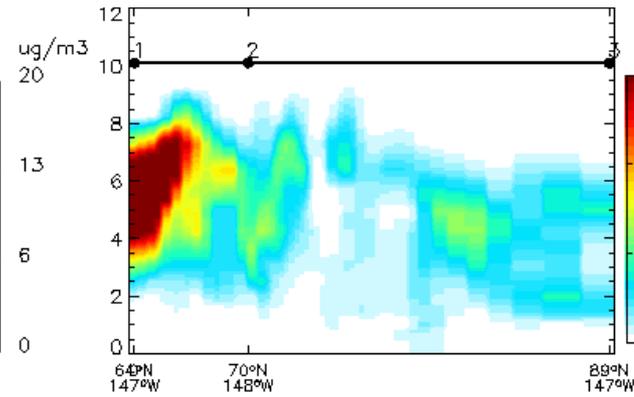
Dust (ug/m³)

16th



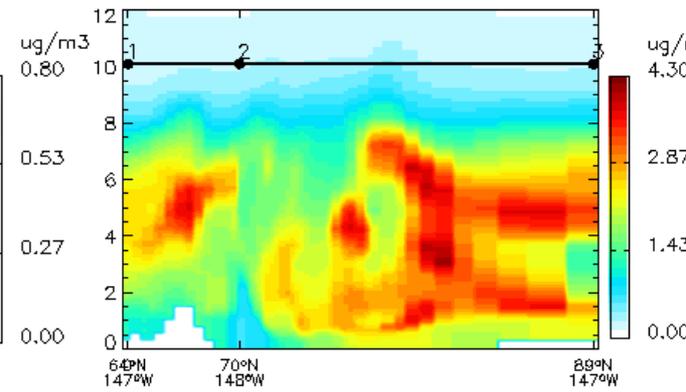
Biomass OC (ug/m³)

16th

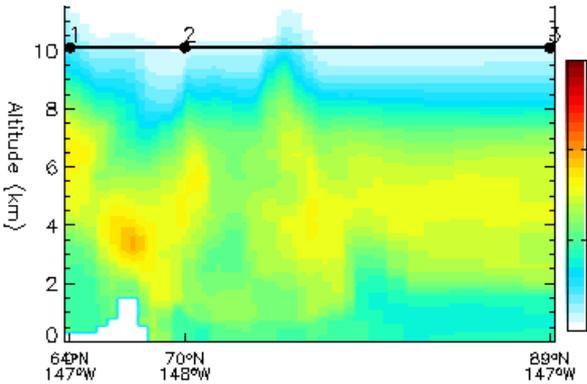


Sulfate (ug/m³)

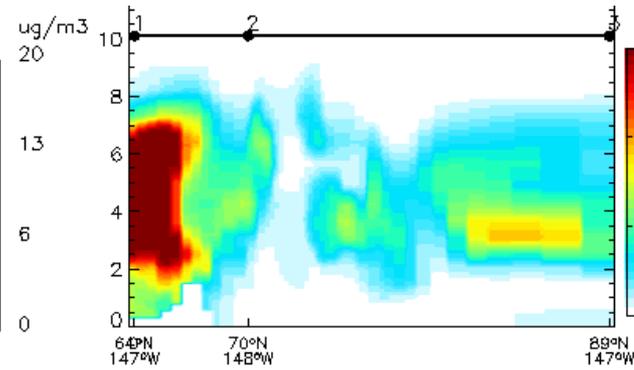
16th



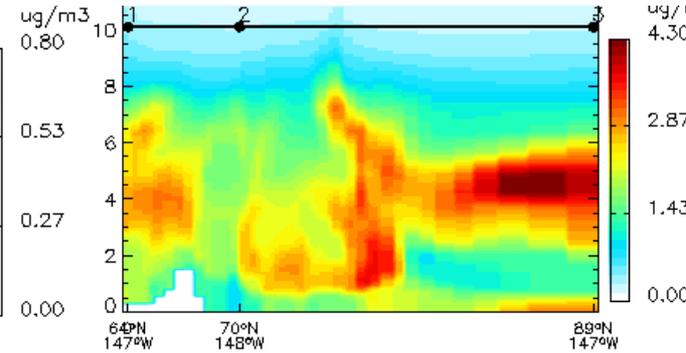
17th



17th



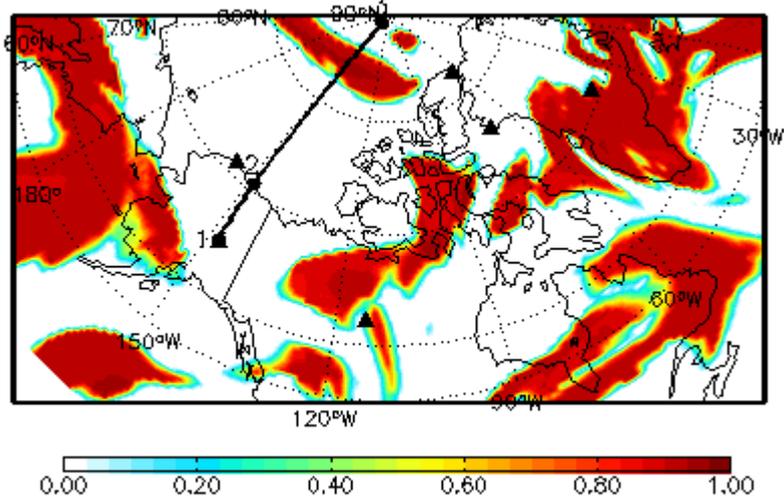
17th



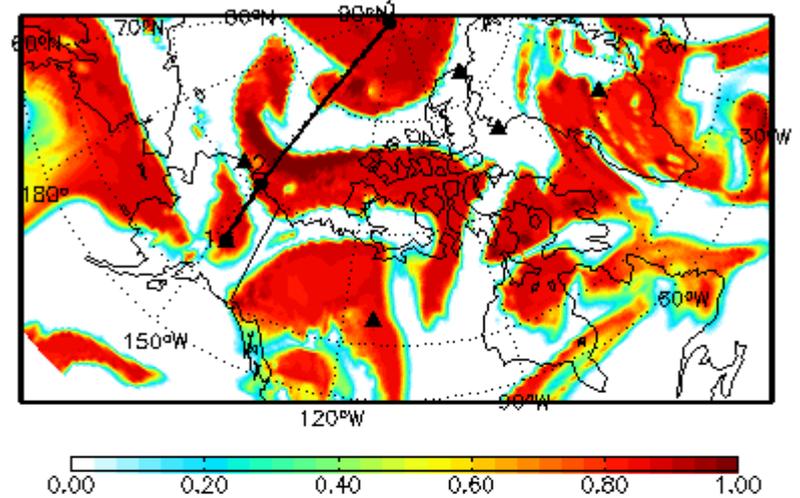
Cloud Fraction : 4/16

GEOS-5 forecast: 20080415_06z

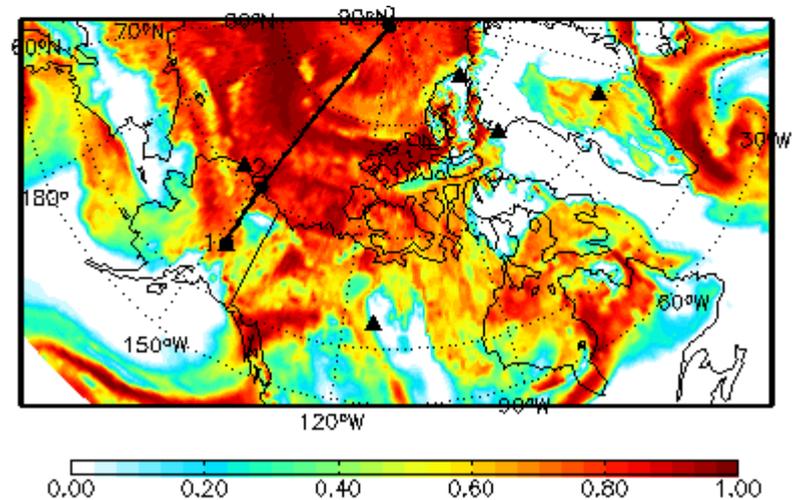
High (<400 mb)



Middle (400-700 mb)



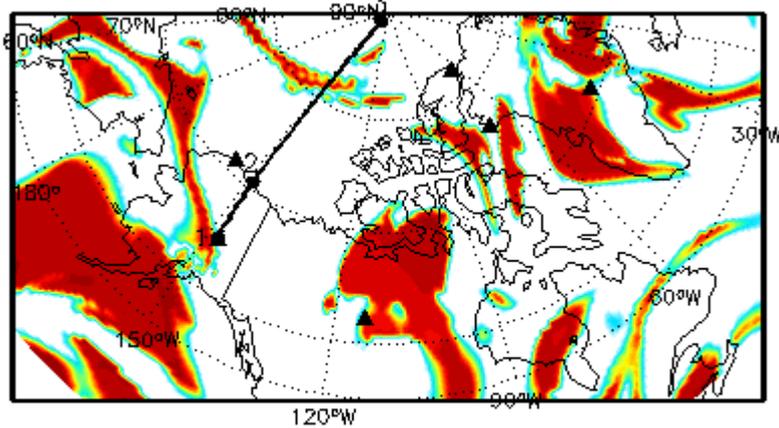
Low (700-1000 mb)



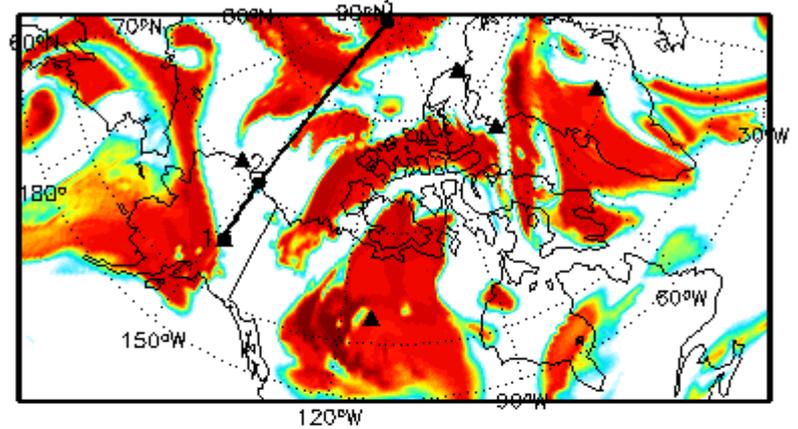
Cloud Fraction : 4/17

GEOS-5 forecast: 20080415_06z

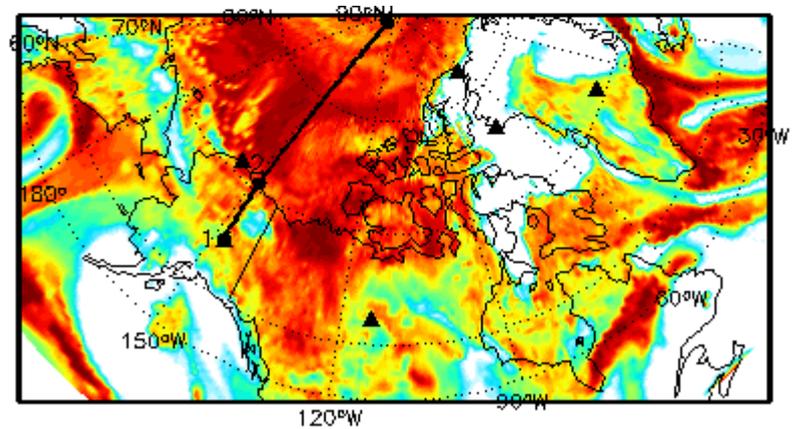
High (<400 mb)



Middle (400-700 mb)



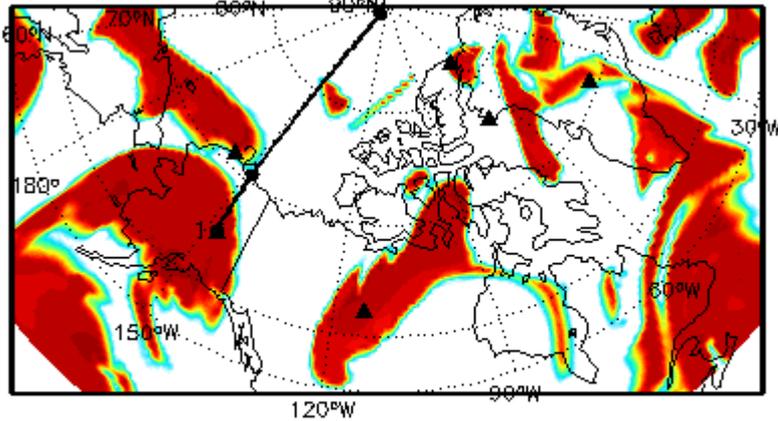
Low (700-1000 mb)



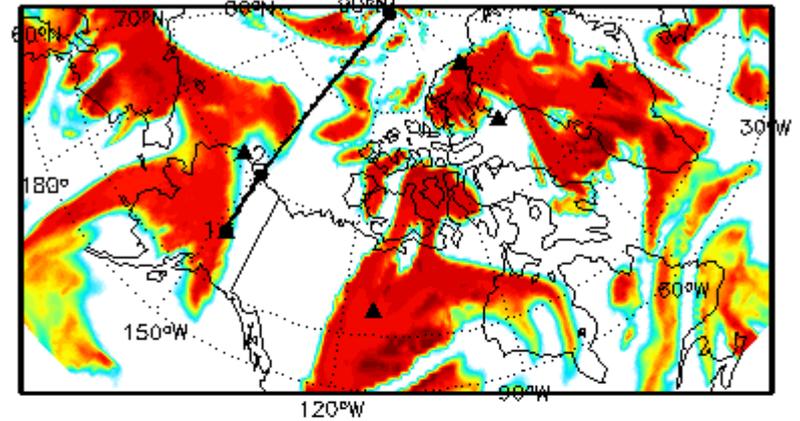
Cloud Fraction : 4/18

GEOS-5 forecast: 20080415_06z

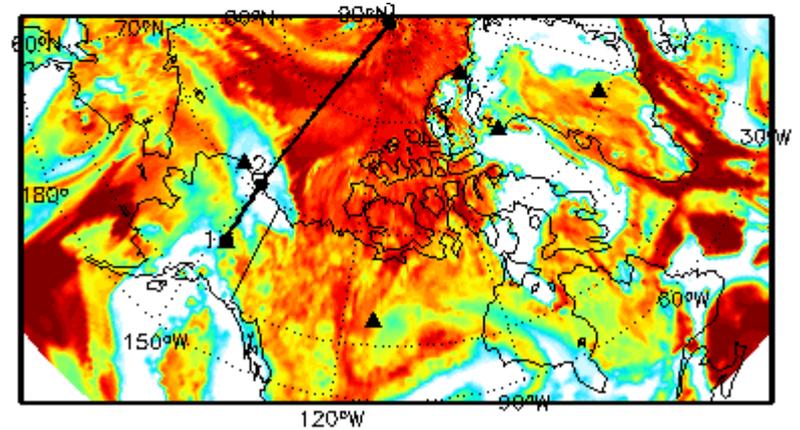
High (<400 mb)



Middle (400-700 mb)



Low (700-1000 mb)

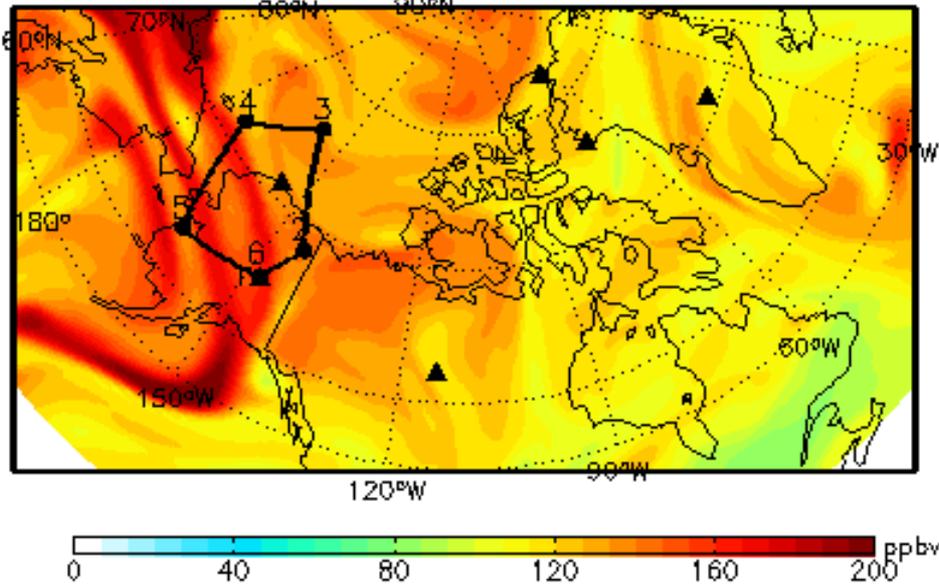


DC-8 : “Pentagon” Flight

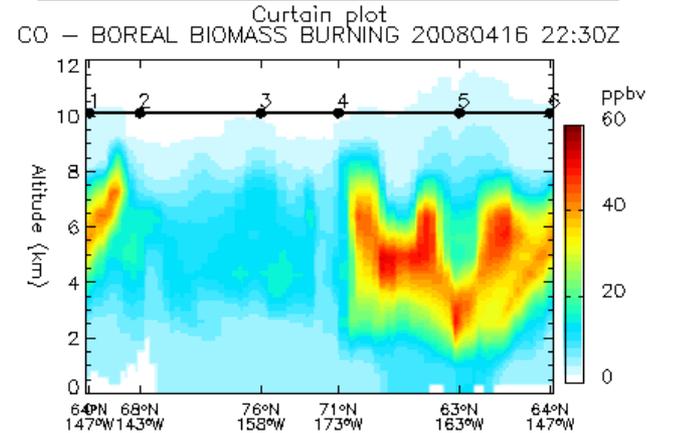
April 16th – 17th

4/16/08 GEOS-5 CO

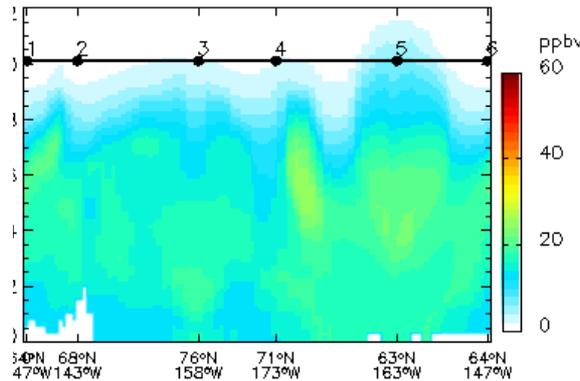
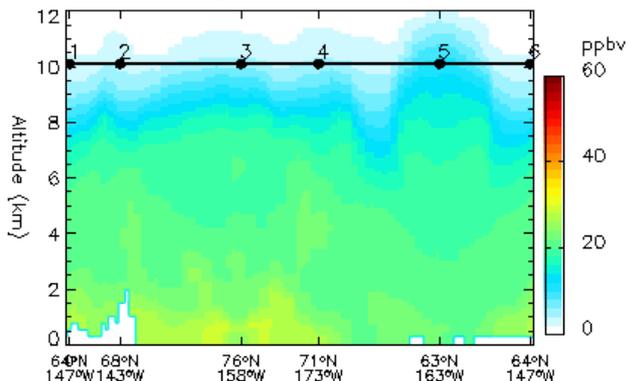
CO MIXING RATIO
500 hPa (5.6 km) 20080416 22:30Z



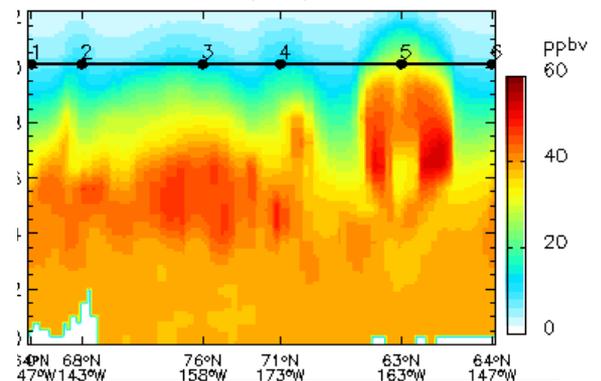
Boreal BB: below Asian pollution



CO - ANTHOPOGENIC (NORTH AMERICA) 20080416 22:30Z - ANTHOPOGENIC (EUROPE) 20080416 22:30Z



CO - ANTHOPOGENIC (ASIA) 20080416 22:30Z

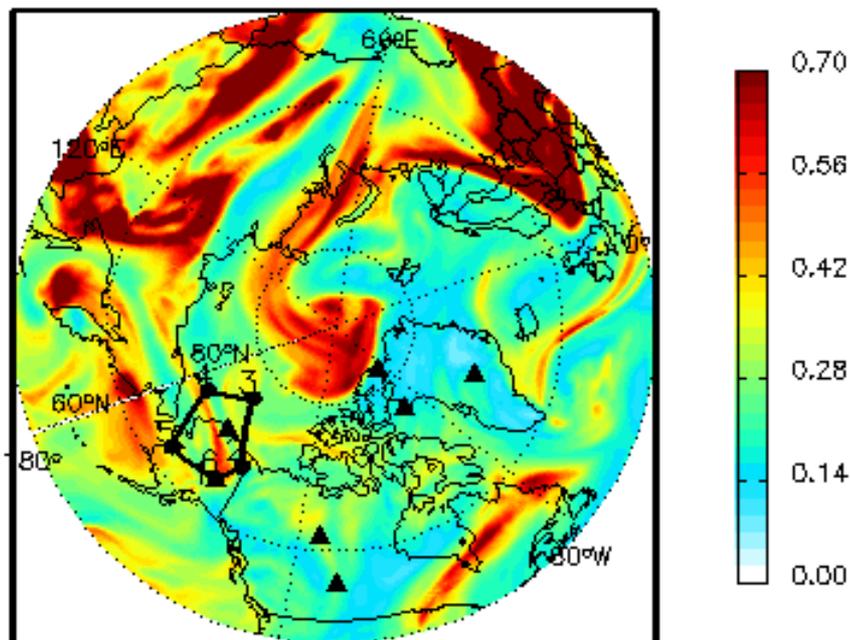


N America pollution: Boundary layer

European pollution: higher over western track than over eastern

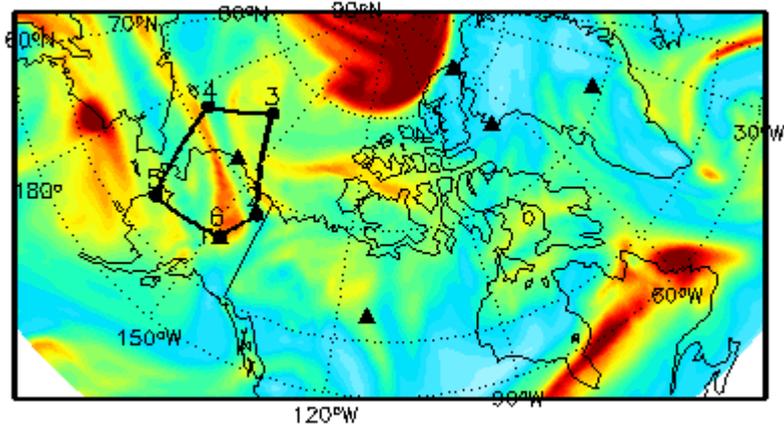
Asian plume: altitude above all plumes over western Alaska

TOTAL AEROSOL EXTINCTION AOT [550 NM]
20080416 22:30Z



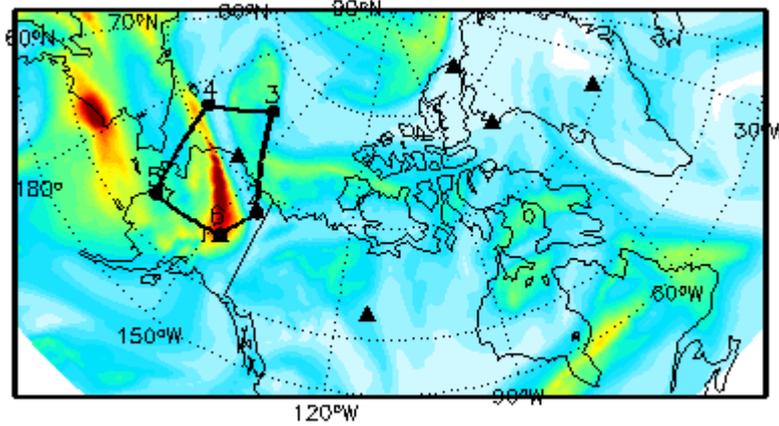
4/16/08
GEOS-5 aerosols

SO4 EXTINCTION AOT [550 NM]
20080416 22:30Z



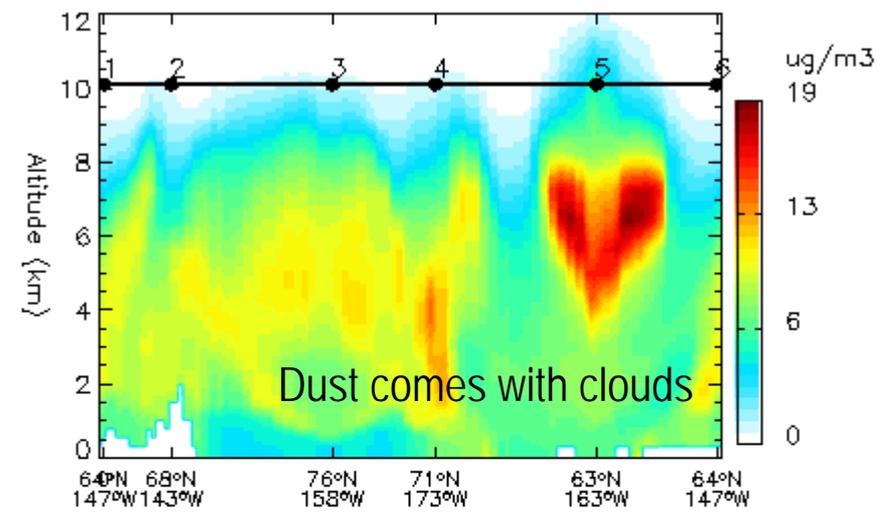
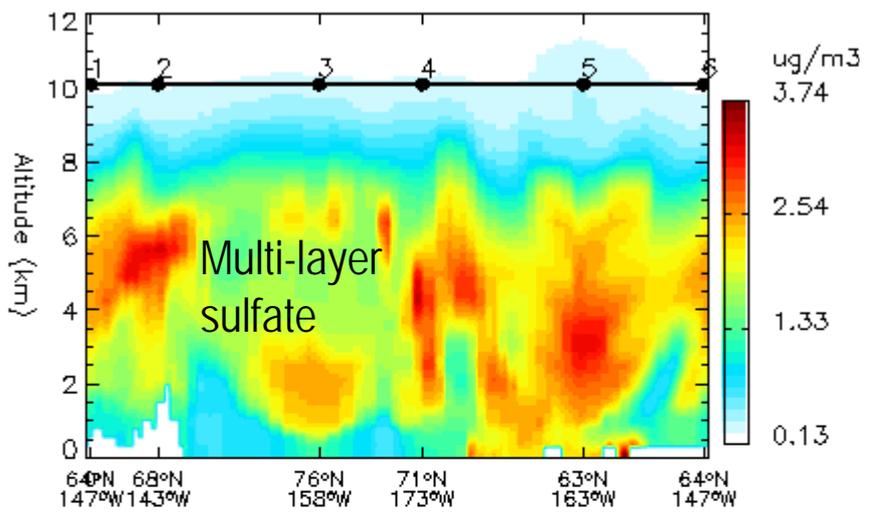
0.00 0.10 0.20 0.30 0.40 0.50

ORGANIC CARBON EXTINCTION AOT [550 NM]
20080416 22:30Z

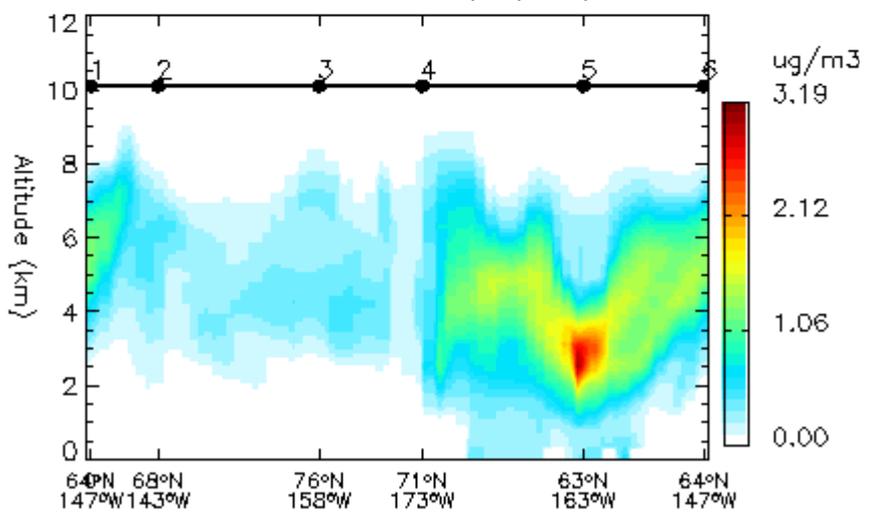


0.00 0.03 0.06 0.09 0.12 0.15

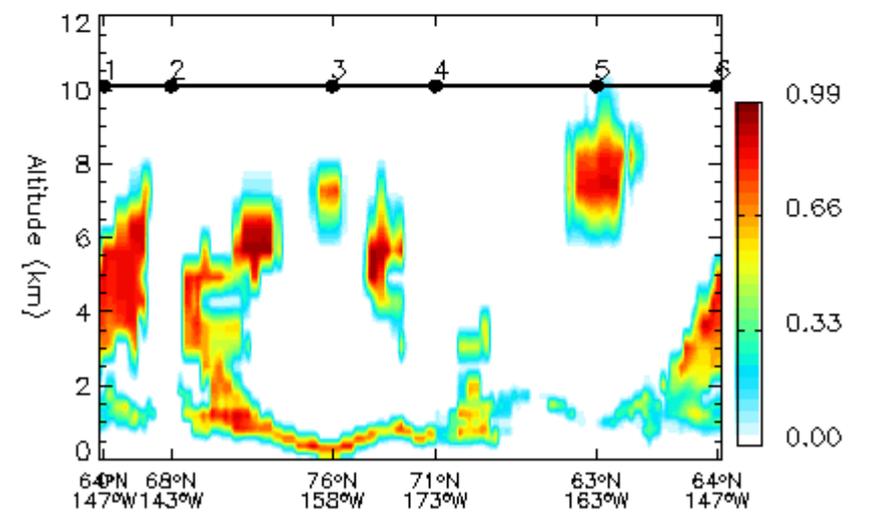
4/16/08 aerosol/clouds along pentagon track



Curtain plot
REAL BIOMASS ORGANIC CARBON ($\mu\text{G}/\text{M}^3$) 20080416 22:30Z

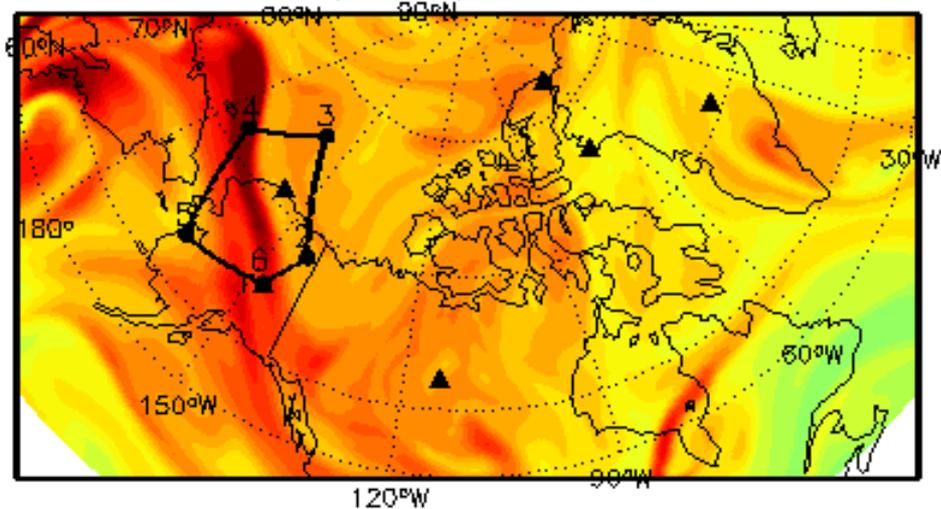


Curtain plot
CLOUD AREA FRACTION 20080416 22:30Z



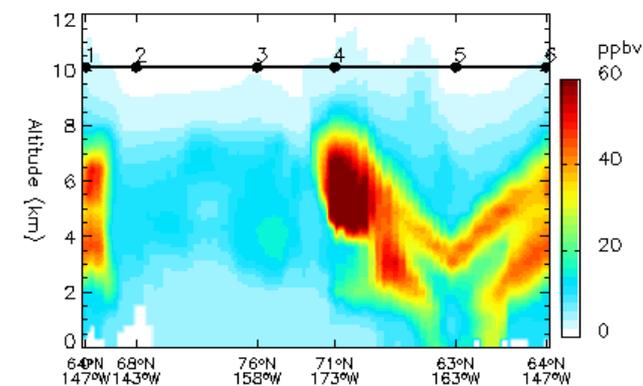
4/17/08 GEOS-5 CO

CO MIXING RATIO
500 hPa (5.6 km) 20080417 22:30Z

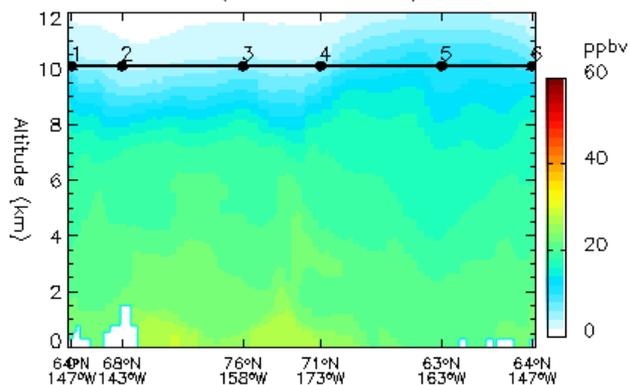


GEOS-5 forecast: 20080415_06z

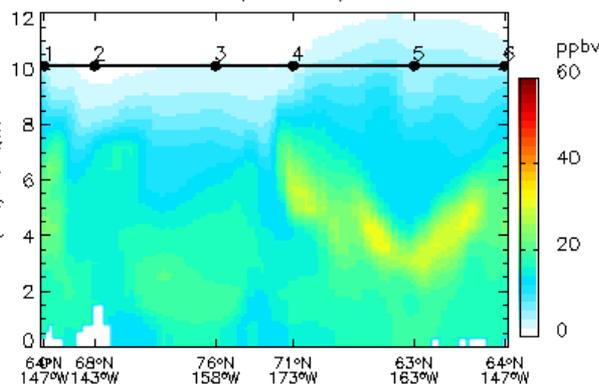
CO - BOREAL BIOMASS BURNING 20080417 22:30Z



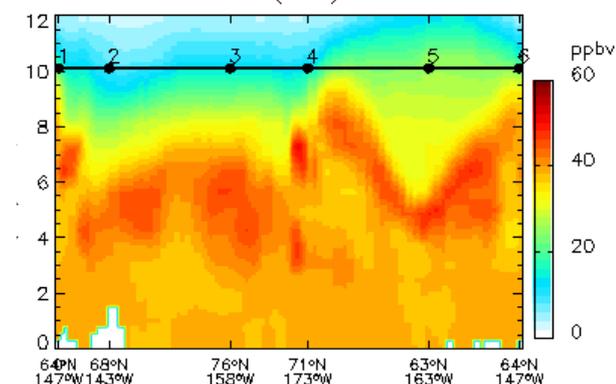
CO - ANTHOPOGENIC (NORTH AMERICA) 20080417 22:30Z



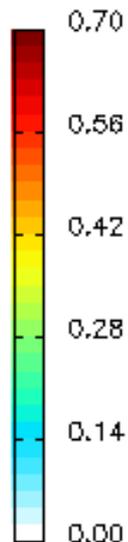
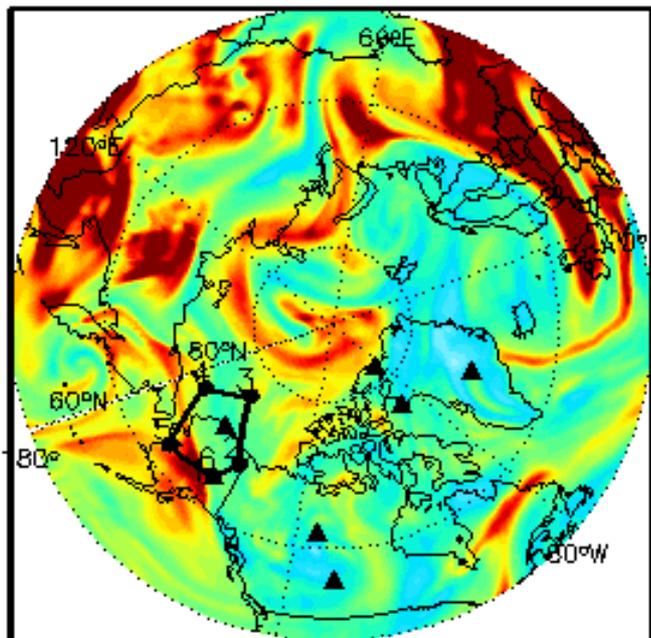
CO - ANTHOPOGENIC (EUROPE) 20080417 22:30Z



CO - ANTHOPOGENIC (ASIA) 20080417 22:30Z

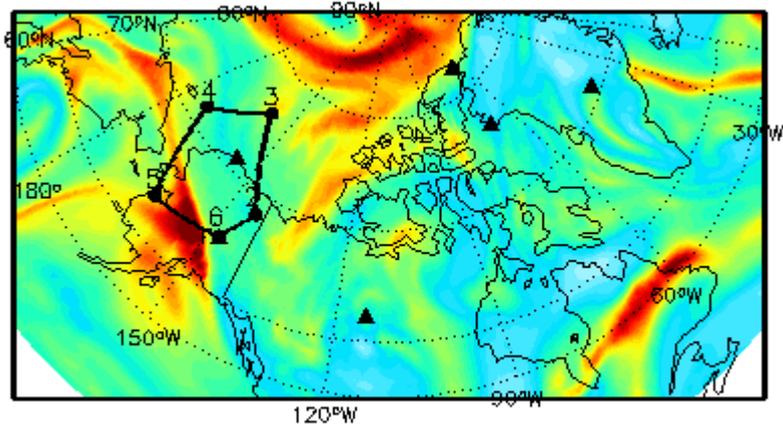


TOTAL AEROSOL EXTINCTION AOT [550 NM]
20080417 22:30Z

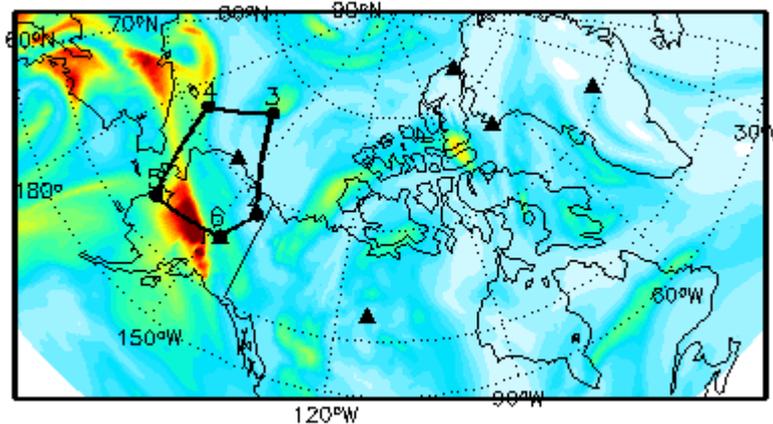


4/17/08
GEOS-5 aerosols

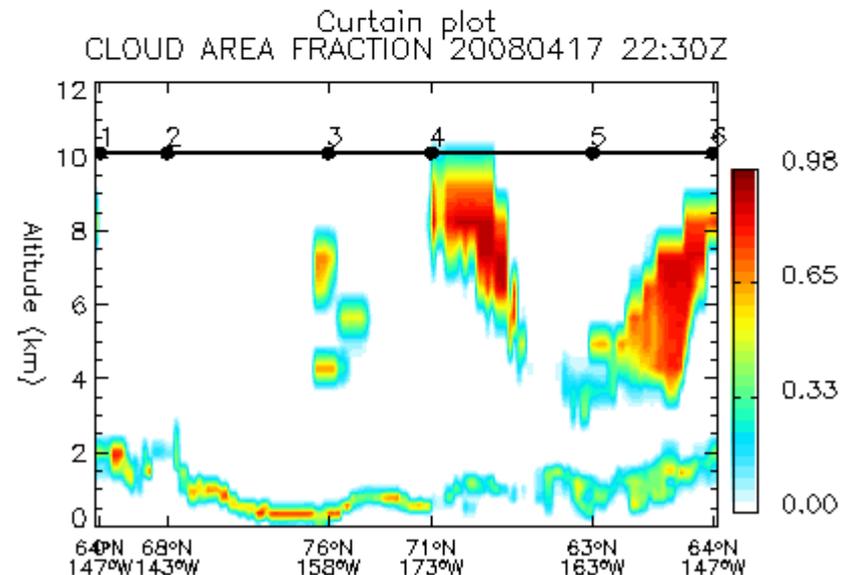
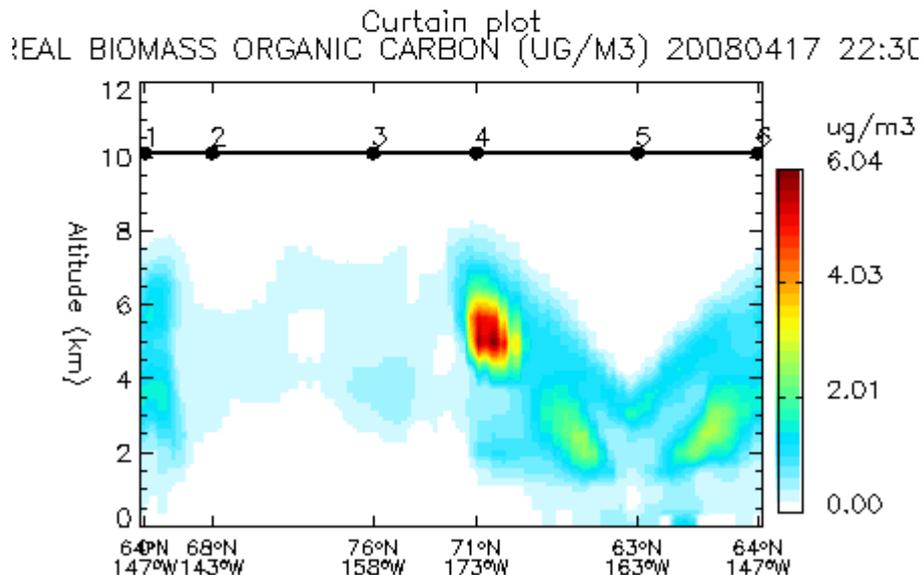
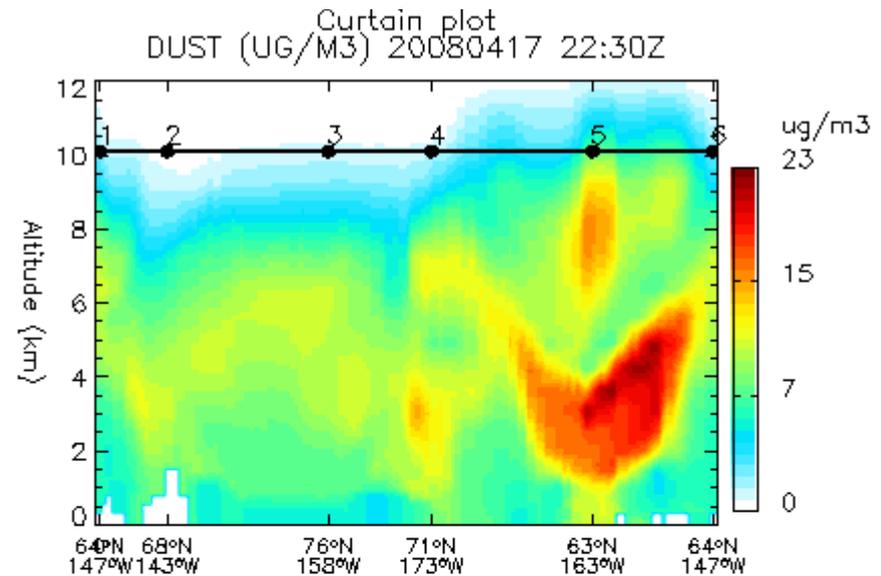
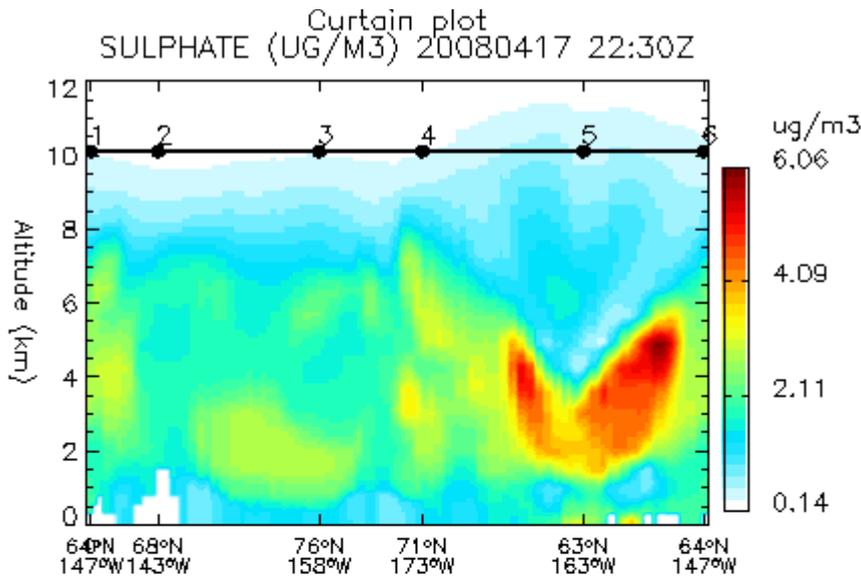
SO4 EXTINCTION AOT [550 NM]
20080417 22:30Z



ORGANIC CARBON EXTINCTION AOT [550 NM]
20080417 22:30Z



4/17/08 aerosol/clouds along pentagon track



April 18th - 19th ?????

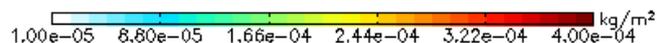
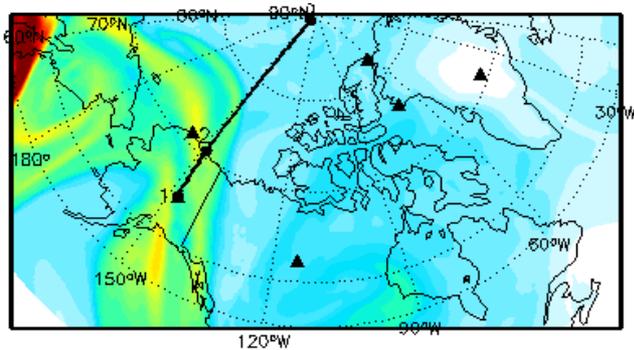
**Asian Air Penetrating High
Arctic!!!!!!**

Boreal CO Column

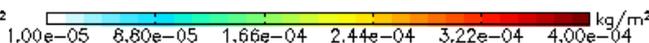
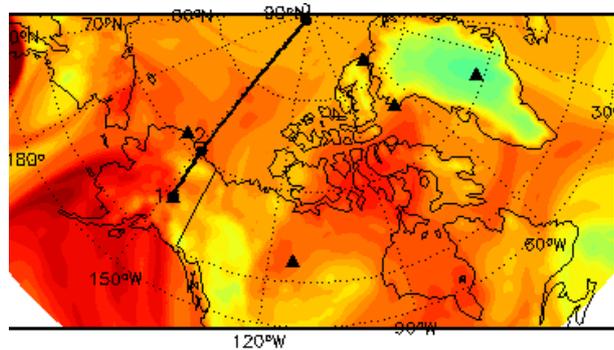
Asian Anthro. CO Column

Euro. Anthro. CO Column

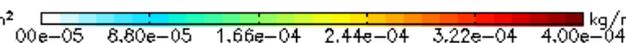
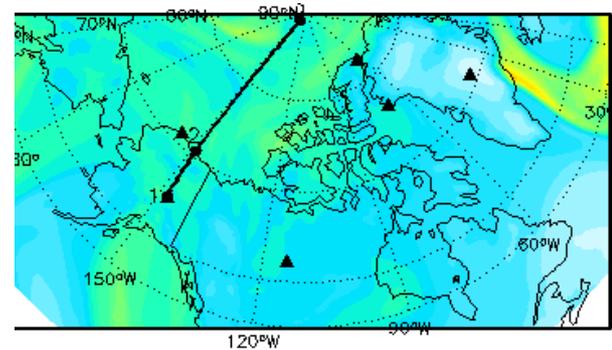
18th



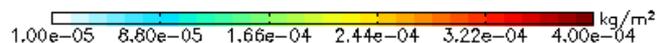
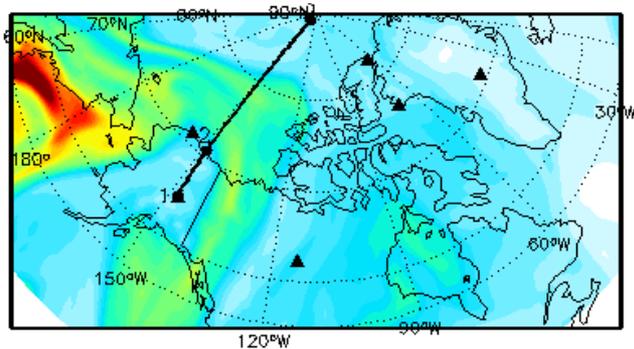
18th



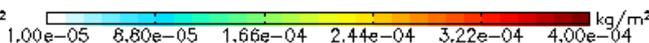
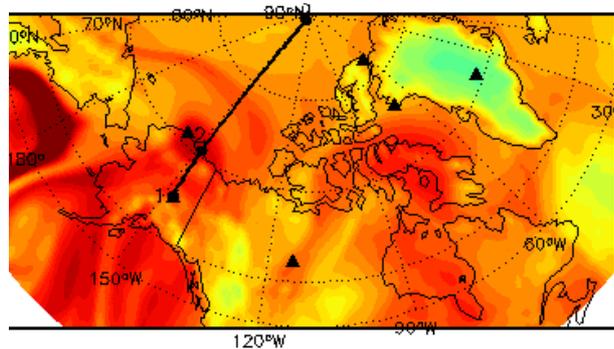
18th



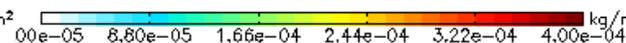
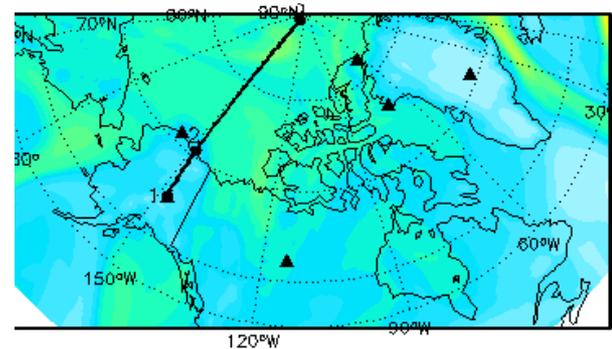
19th



19th



19th



Well Mixed: N. American Anthro. Nonboreal Biomass Burning

Boreal CO

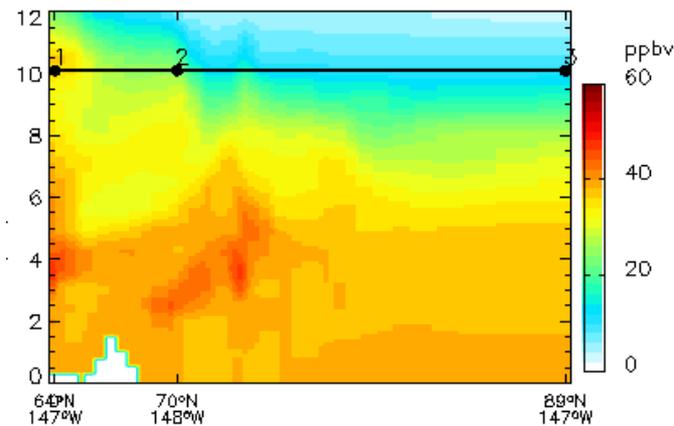
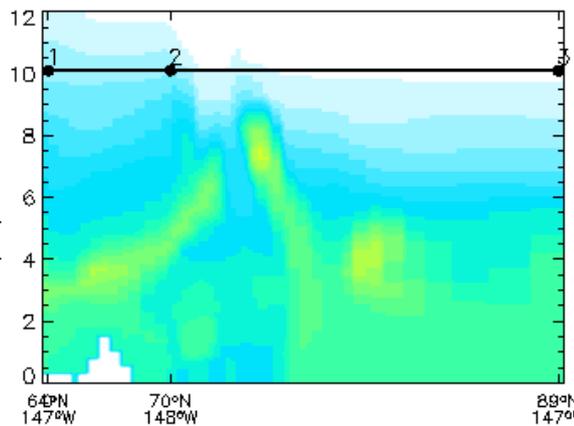
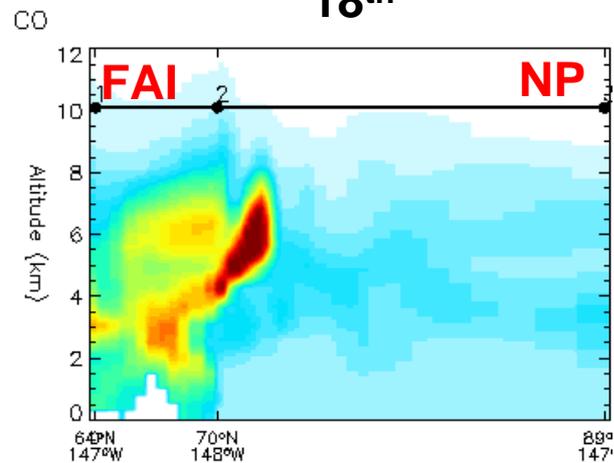
18th

Euro. Anthro. CO

18th

Asian Anthro. CO

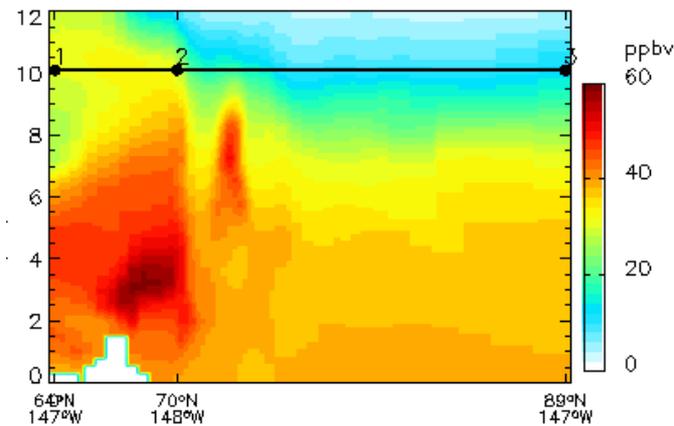
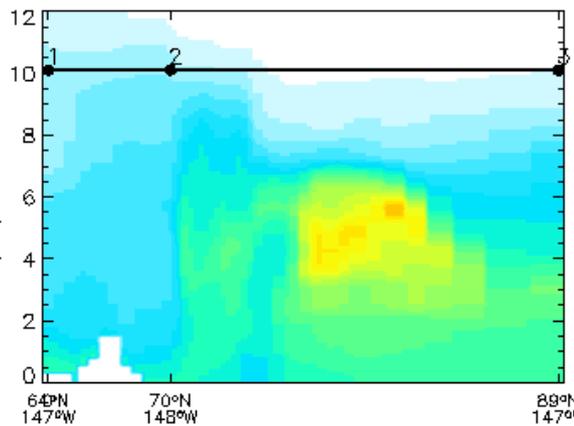
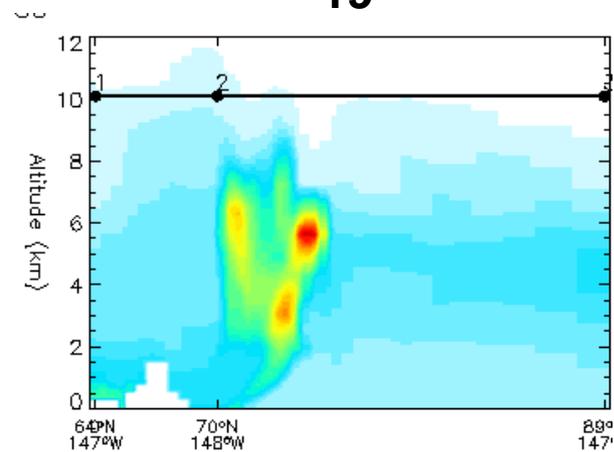
18th



19th

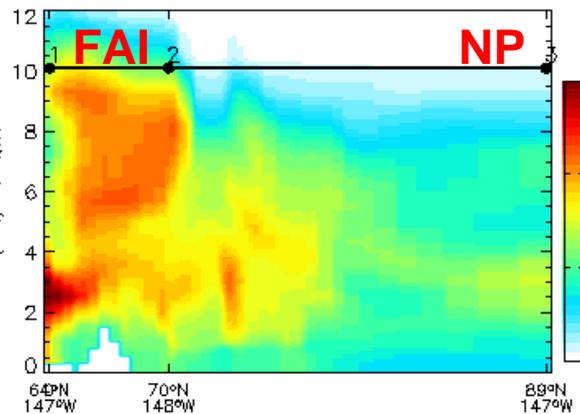
19th

19th



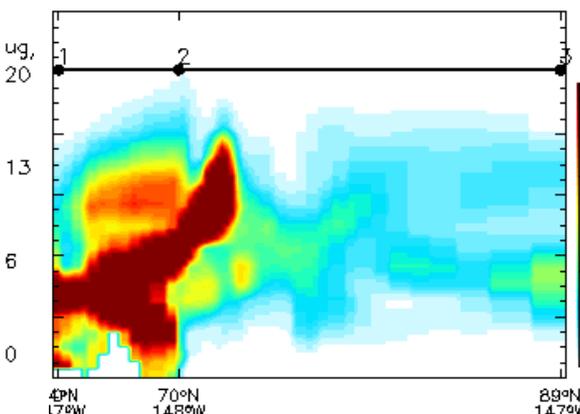
Dust (ug/m³)

18th



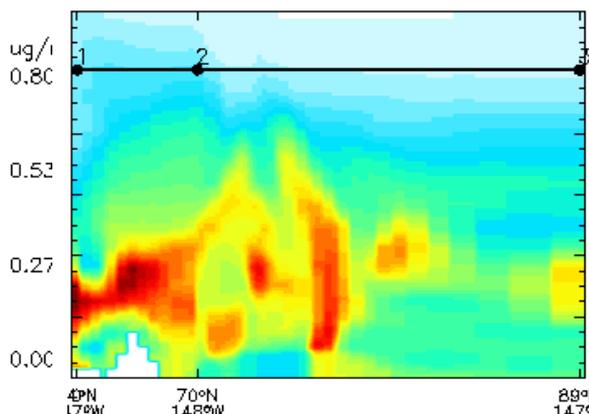
Biomass OC (ug/m³)

18th

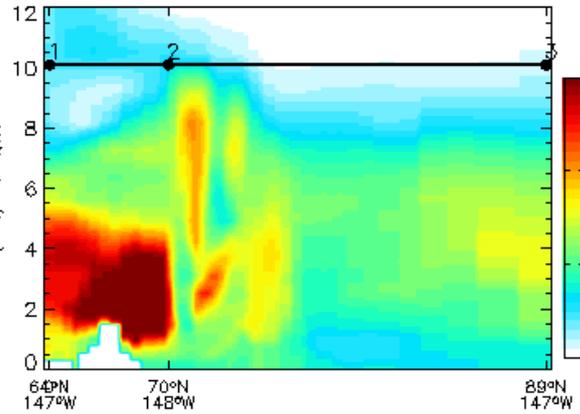


Sulfate (ug/m³)

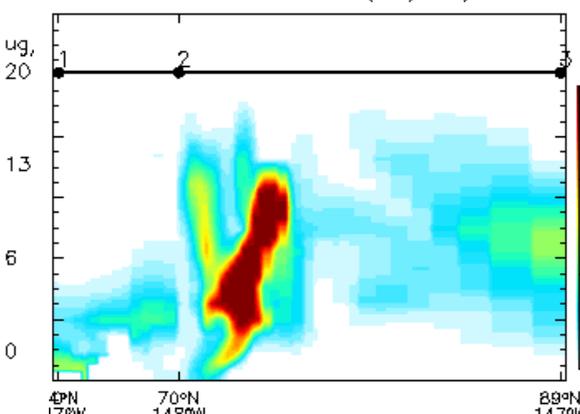
18th



19th



19th



19th

